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14. ABSTRACT

Prostate cancer (PCa) is the leading cancer among men in the United States, and is a disease with strong genetic susceptibility. The genetic susceptibility is due to the inheritance of altered germline DNA sequences, either in the form of point mutations such as single nucleotide polymorphisms (SNPs), or deletions/gains of a string of nucleotides such as copy number polymorphisms (CNPs). Most current genetic studies focus only on the role of SNPs in genetic susceptibility. In contrast, few studies have explored the role of deletions/gains in cancer predisposition, due to limited methods. In fact, germline deletions/gains are common in the human genome and may have a significant impact on gene products because they can involve an entire gene or a significant portion of a gene. They may play a more important role in hereditary PCa (HPC), a type of PCa that is likely due to germline changes in major genes. We have successfully completed the study by identifying common germline CNVs in hereditary prostate cancer (HPC) patients; and identifying a candidate germline CNV that is associated with hereditary prostate cancer risk among Ashkenazi Jews. We also tested the association of these germline CNVs with prostate cancer risk in all HPC family members.

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Prostate cancer; Germline copy number variation, hereditary

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INTRODUCTION

Prostate cancer (PCa) is the most common cancer among men in the United States and is a disease with strong genetic susceptibility. The genetic susceptibility is due to the inheritance of altered germline DNA sequences, in the form of point mutations such as single nucleotide polymorphisms (SNPs), or deletions and gains of a string of nucleotides such as copy number variants (CNVs). Most current genetic studies focus only on the role of SNPs in genetic susceptibility. In contrast, few studies have explored the role of deletions and gains in cancer predisposition due to limited methods. Germline deletions and gains are common in the human genome and may have a significant impact on gene products due to their involvement of an entire gene or a significant portion of a gene. Deletions and gains in the genome may play an important role in the development of hereditary PCa (HPC), a type of PCa that is thought to be caused by germline changes in major genes.

In this DOD funded proposal, we propose to 1) identify germline CNVs in the genome among high-risk PCa patients using the Affymetrix 500K SNP mapping panel; and 2) test for their associations with PCa risk using family-based association tests.

BODY

Approved Statement of Work

Aim 1: To identify germline CNPs in the genome among high-risk PCa patients using the Affymetrix 500K SNP mapping panel.

1) **(Months 1-4)** Regulatory review and approval process for human studies.
2) **(Months 5-12)** Genotype ~500K SNPs among two affected members from each of the 206 HPC families ascertained at Johns Hopkins Hospital using the Affymetrix 500K SNP mapping panel. We anticipate an average call rate > 95% using the default mapping algorithm setting. By applying methodology recommended by Affymetrix for improving the call rate of heterozygotes, we expect to achieve an average call rate >98%.
3) **(Months 13-18)** Estimate DNA copy numbers at each of these ~500K SNPs and identify germline CNPs in the genome using a computer software package, DNA-Chip Analyzer (dChip). Based on the estimated DNA copy number of these ~500K SNPs, we will identify germline CNPs using a set of criteria implemented in our scripts. For putative deletions, we will use the working criteria of a minimum of three out of four consecutive SNPs with a separation of ≥ 0.5 in CN between groups of subjects, and homozygous genotypes. A long string of consecutive homozygous SNPs (also defined as LOH) provides an important tool to identify deletions. For putative gains, we will use the working criteria of a minimum of three out of four consecutive SNPs with a separation of ≥ 0.5 in CN between groups of subjects.

Aim 2: To test for associations of identified germline CNPs with PCa risk in high-risk PCa families using family-based association tests.

1) **(Months 19-20)** Select recurrent CNPs that overlap with genic regions and intergenic regions that contain highly conservative sequences for further evaluation. A genic region is defined as the region within 20 Kb upstream of the most 5' boundary, its transcribed regions including introns, and the region within 10 Kb of the most 3' boundary. CNPs located in intergenic regions and containing evolutionarily conserved sequences will also be included in the association tests. Based on our preliminary data, we expect ~43% of

germline CNPs (~645) contain at least one gene. Of which, ~70% CNPs have frequency > 1% and ~30% CNPs (~200) have frequency >5%. Among these selected CNPs, we will prioritize our efforts to further select ~20 CNPs that are most consistently observed in multiple affected members among families.

2) **(Months 21-30)** Perform quantitative PCR (qPCR) for these 20 CNPs to confirm these CNPs and to measure them in the remaining subjects of the 206 HPC families. qPCR will be performed using the ABI Prism 7500 Sequence Detection System. Three concentrations of each genomic DNA sample (20, 10, and 5 ng) will be assayed in duplicate, using each pair of real-time PCR primers. Cycle number (Ct) values for the control and test amplicons for the three dilutions of each DNA sample will be plotted against each other, and the offset between the two samples, along the control-amplicon axis and test-amplicon axis will be measured. An offset of 0.8–1.2 along the test-amplicon axis will be taken to indicate a copy number difference of 1 to 2 ratios between the two samples at that locus.
3) **(Months 31-36)** Perform family-based association tests to assess associations of these CNPs with PCa. Family-based association tests will be performed using a computer software package, FBAT. All subjects will be coded as having homozygous wildtype, heterozygous, or homozygous variants at each of these selected CNPs based on qPCR results. Most of germline deletions or insertions are expected to be heterozygous, therefore making transmission tests informative (transmission tests assess whether heterozygous parents over-transmit an allele to affected offspring). We have power to detect rare and highly penetrant CNPs or common (high or low penetrance) CNPs under additive and dominant models Among the 20 FBAT tests, we expect to find one CNP to be significant by chance at $P < 0.05$.

Summary report

Genotyping platform. Initially, we proposed to genotype two affected members in each of the 206 hereditary prostate cancer families using the Affymetrix 500K SNP array. However, we have upgraded our system as an improved Affymetrix SNP array (6.0) became available. This platform helped us to accomplish our aims more efficiently. This panel contained more than 906,600 SNPs and more than 946,000 probes for the detection of copy number variation. Among these CNV probes, 202,000 of them target 5,677 known regions of copy number variation from the Toronto Database of Genomic Variants. All SNPs on the Array 6.0 Panel went through a more rigorous screening and validation process than the earlier generations of SNP arrays. The median inter-probe distance taken over all 1.8 million probes is less than 700 bases. Therefore we used the Affymetrix SNP array (6.0) for this analysis. The additional cost associated with using the new version of Affymetrix SNP array was absorbed through support from our institution, as proposed in our initial grant application.

Study population. We increased the number of families studied from 202 to 212 and DNA samples for all family members studied from Johns Hopkins Hospital were analyzed. These families were ascertained from three resources. They were ascertained through referrals generated in response to a letter by Dr. Patrick Walsh to 8,000 urologists throughout the country, from family history records of the patient population seen at Johns Hopkins Hospital for treatment of prostate cancer, and from the respondents to articles published in a variety of lay publications describing our prostate cancer family studies.[1-2] Prostate cancer diagnosis was verified by medical record review for each affected male included in the study. Each man's age at prostate cancer diagnosis was confirmed either through medical record review or from two other independent sources. The mean age at diagnosis for men included in the study was 64.3 years. The number of families with 3, 4, or 5 or more affected individuals was 28, 50, and 128,

respectively. Eighty-two percent of the families were of Caucasian ethnicity and 9.2% were of African-American ethnicity.

Results. We have successfully completed genotyping for 447 subjects from hereditary prostate cancer families using the Affymetrix 6.0 SNP array. We exceeded our target size of 412 using our own research funds as part of cost share. The quality of the genotyping for these subjects is excellent.

Based on the estimated DNA copy number of these SNPs, we identified germline CNVs using a set of criteria implemented in our scripts. For putative deletions, we used the working criteria of a minimum of three of four consecutive SNPs with a separation of ≥ 0.5 in CN between groups of subjects and homozygous genotypes. A long string of consecutive homozygous SNPs (also defined as loss of heterozygosity) provided an important tool to identify deletions. For putative gains, we used the working criteria of a minimum of three of four consecutive SNPs with a separation of ≥ 0.5 in CN between groups of subjects.

As detailed in the **Supplementary Table**, we have identified 1,141 germline CNVs in these samples. Among them, 118 CNVs have a frequency that is 5% more common than that in the HapMap databases, suggesting the importance of these CNVs in hereditary prostate cancer.

In year 2, we focused on one particular germline CNV. By comparing allele intensities of SNP probes across the genome, a relatively large (~209 kb) germline deletion at 3p14 was observed among 6 of 39 (15.4%) Ashkenazi Jewish (AKJ) subjects included within this study population. This deletion was not observed among 408 non-AKJ samples, suggesting this is an AKJ founder mutation. For additional verification, we genotyped this deletion in AKJ HPC probands recruited at Wake Forest University (WFU), finding the deletion in 4 of 18 (22%) subjects. We confirmed that the size and boundaries are consistent in each sample by sequencing the entire deletion region among carriers. To evaluate the significance of this deletion in the general AKJ population, it was genotyped among 412 additional subjects. The deletion was observed among 5 of 148 (3.4%) non-HPC PCa cases and 15 of 264 (5.6%) unaffected controls from McGill University. Overall, we observed the deletion in 10 of 57 AKJ HPC probands (17.5%), in comparison to only 20 of 412 non-HPC AKJ subjects (4.9%) This difference was statistically significant (P = 0.002) (**Table 1**). This germline deletion resides within intron 5 of the FHIT gene, where previously reported polymorphisms have been found to be associated with PCa and a variety of other cancers. While our report adds to the growing evidence implicating the FHIT gene in cancer, we are the first to describe this AKJ founder germline deletion, and the first to implicate this candidate gene based upon a genome-wide search. Additional confirmation of this association and functional studies are warranted.

Table 1. Summary information for a germline deletion

Study	# of subjects	# with deletion	% of deletion
JHH-HPC-AJ-probands	39	6	15.38%
WFU-HPC-AJ-subjects	18	4	22.22%
MaGill-AJ-controls	264	15	5.68%
MaGill-AJ-PCa	148	5	3.38%

In year 3, we completed testing for concurrence in common CNVs and the association between a subset of the 1,141 germline CNVs with hereditary prostate cancer risk using family-based association test. Common CNVs were defined and called using the Canary algorithm available in the Affymetrix Genome Console 3.0 software (McCarroll et. al., 2008). In this study sample, we detected a total of 1,006 common CNVs, about 76% of the total collection of 1,319 known CNVs. The decreased coverage of CNVs in our sample as compared with that reported by McCarroll is likely due to population differences. In contrast to the subjects coming from multiple ethnic groups in the HapMap project, all the subjects in our sample set are Caucasian. Among the 1,006 CNV regions, 667 (~66% of the total) are germline deletion only, 172 (~17% of the total) are germline amplification only, and 167 (~17% of the total) are combined deletion & amplification. These percentages are comparable to those obtained by McCarroll (66%, 15% and 19%). The average CNV in each sample is 140 (13.9% of the total common CNVs), ranging from 108 (13.7%) to 237 (23.6%). Having compared the expected concurrent ratios with the observed ones, we did not find any significant (p<0.05) difference for the germline deletions with high (f>0.05) allele frequencies. For CNVs with low allele frequencies (0.01<f<0.05), we detected nineteen germline deletions where the observed concurrent ratios were two folds greater than the expected values, as listed in **Table 2**.

Table 2. The selected common CNVs with relative high observed concurrent ratios in matched HPC pairs

CNV ID	Chr	Start[1]	End	Size	Allele Freq.	# of Carrier	O(cr)[2]	E(cr)[3]	O(cr)/E(cr)
145	1	193,676,328	193,682,368	6,040	0.0120	5	0.67	0.33	2.01
512	3	166,751,814	166,779,809	27,995	0.0168	7	0.75	0.33	2.24
641	4	104,426,263	104,467,383	41,120	0.0168	7	0.75	0.33	2.24
709	4	158,949,012	158,950,828	1,816	0.0120	5	0.67	0.33	2.01
973	6	77,073,713	77,084,327	10,614	0.0120	5	0.67	0.33	2.01
1042	7	4,383,474	4,385,353	1,879	0.0120	5	0.67	0.33	2.01
1115	7	86,072,821	86,082,341	9,520	0.0120	5	0.67	0.33	2.01
1495	9	106,403,809	106,406,604	2,795	0.0168	7	0.75	0.33	2.24
1702	11	25,565,122	25,584,722	19,600	0.0240	9	0.80	0.34	2.37
1707	11	30,129,311	30,137,019	7,708	0.0120	5	0.67	0.33	2.01
2204	16	77,617,649	77,620,658	3,009	0.0168	7	0.75	0.33	2.24
10359	2	110,173,879	110,519,409	345,530	0.0144	6	1.00	0.33	3.00
10616	3	166,523,806	166,564,633	40,827	0.0120	5	0.67	0.33	2.01
10767	4	104,961,839	104,980,713	18,874	0.0168	7	0.75	0.33	2.24
11143	6	143,911,563	143,914,293	2,730	0.0168	7	0.75	0.33	2.24
11333	7	154,515,932	154,520,474	4,542	0.0120	5	0.67	0.33	2.01
12049	12	128,624,510	128,626,094	1,584	0.0120	5	0.67	0.33	2.01
12575	18	40,019,717	40,030,582	10,865	0.0168	7	0.75	0.33	2.24
12724	20	16,516,058	16,534,634	18,576	0.0120	5	0.67	0.33	2.01

Note: (1) The physical position is based on hg18 build.
(2) Observed concurrent ratio.
(3) Expected concurrent ratio.

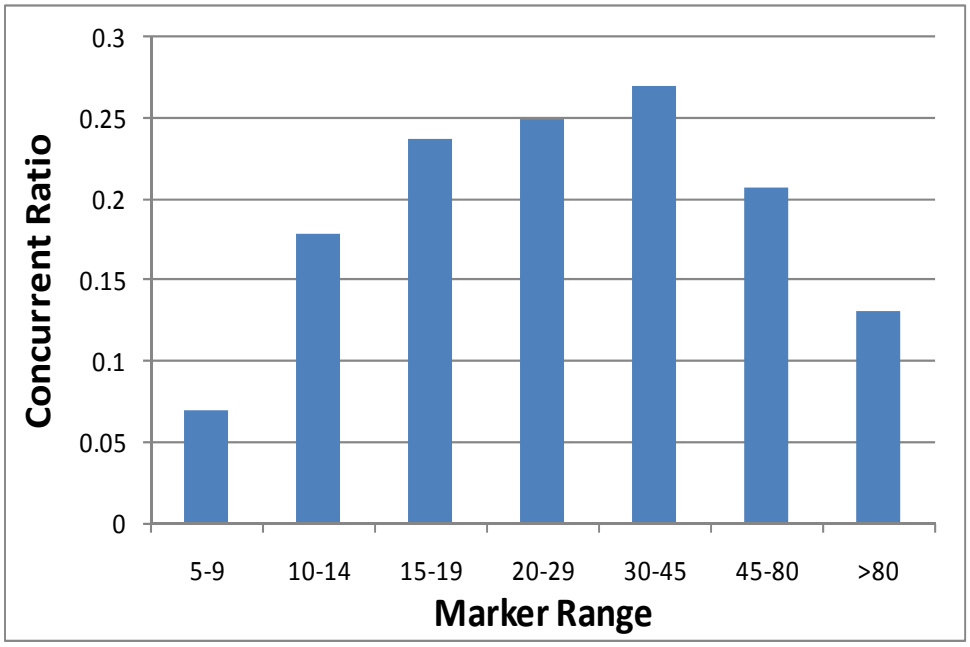
Among the nineteen regions of low allele frequency, sixteen regions do not include known genes. Two regions, located in 12q24 and 16q23 respectively, disrupt the intron regions of TMEM132D and WWOX. The largest region was located at 2q13 with a length of 354 kb and encompassed two genes, MAL-like protein (MALL) and nephrocystin (NPHP1). It is worth mentioning that the six 2q13 deletion carriers were from three HPC families so that the observed concurrent ratio was three times higher than the expected value. MALL is a

transmembrane protein with 40% homologous to T-cell differentiation protein MAL but not express in T cells. Little is known about the function of the MALL gene, though one study concluded that the protein was an element of the machinery in raft-mediated trafficking in endothelial cells (DeMarco et al., 2001). Deletion of the NPHP1 gene has been proven to be responsible for juvenile nephronophthisis (Konrad et al., 1996, Saunier et al., 2000). To date, there is no evidence suggesting the correlation of the two genes in 2p13 with any kind of cancer. In contrast, many studies, either *in vivo* and *in vitro,* suggest that WWOX is a suppressor for tumor growth and insufficient expression of the protein could lead to tumorigenesis in multiple tissues (Del Mare et al., 2009). In knock out mice, the spontaneous tumor incidence was 5 folds higher in heterozygous animals, WWOX (+/-), than that found in WT animals (Aqeilan et al., 2007). The expression of WWOX in prostate cancer, assessed by immunohistochemical staining, was low or non-expressive in 144 of 170 (84%) and the reductions were correlated with high expression of Ki-67 protein (Qin et al., 2006).

Heritable rare CNVs in HPC subjects

The results of the common CNVs suggest that the common CNVs with high allele frequencies are unlikely to have high penetrance in HPC. We, therefore, detected all the germline deletions by Hidden Markov Model (HMM) and screened the rare CNVs by filtering out all CNVs that overlapped, in a degree of 20% or above, with any of 1,319 common CNVs. There were 687 deletion fragments that met the criteria, with the average number of markers encompassed in the fragments being ~24. The reliability of a CNV call deteriorates with the decreasing number of markers so we evaluated the quality of the called CNV by examining the degrees of the deviation of the concurrent ratios from the expected values. To increase the accuracy of the expected concurrent ratios for germline deletions that have the same number of markers, we binned the deletions into groups according to the number of markers. **Figure 1** is the concurrent ratios with the binned samples.

Figure 1



As discussed above the concurrent ratios for samples in a bin should be close to 1/3, given the CNVs are rare. Undervalued concurrent ratio would imply the significant portion of CNV calls were mistaken, as demonstrated in **Figure 2a** and/or de novo CNVs.

Figure 2

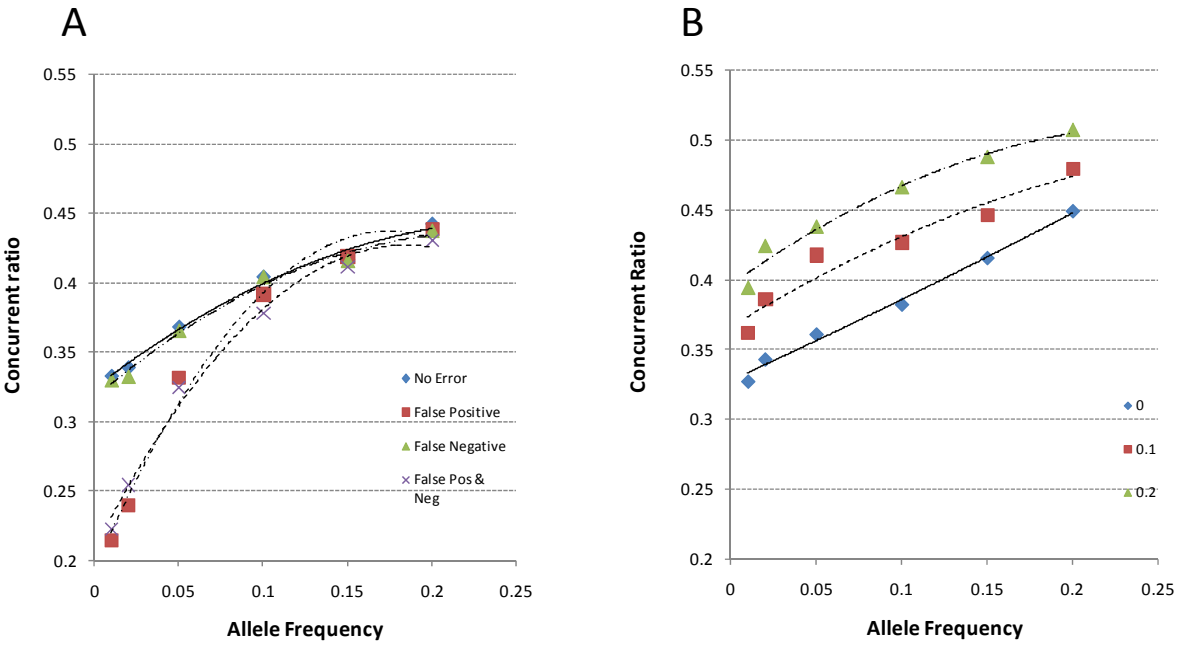


Figure 2. Simulation of concurrent ratio as function of allele frequency. Simulations were performed on 10,000 samples and five repeats. The simulations were performed under four conditions: 1% false positive (squares), 1% of false negative (triangles), 1% false positive and 1% false negative (crosses) and no error (diamonds) (A). The simulations were also performed for randomized sampling (diamonds) and non-randomized samplings at 10% selection (squares) and 20% selection (triangles) that favor a genotype marker (B). Fitting curves were represented by lines.

From Figure 1 we observed that (1) the concurrent ratios in each bin were all below the theoretic number of 1/3, (2) the ratio improved as the number of markers increased, and (3) the ratio decreased again in the last two bins. These observations suggested that the accuracy of calls on germline deletions improved as the number of the marker increased. The decline in the rates of CNVs with the greater number of markers in the last two bins was likely due to the greater portion of de novo CNVs in total called CNVs. Using the simulation program, we found a 24% concurrent ratio, corresponding to the bin having 15 of 19 makers,. This concurrent ratio is equal to 0.4 % of the combined false positive and false negative calls. The true false CNV calls should be found to a lesser degree because part of the underestimation came from de novo CNVs inevitably. To maintain the quality of the data and the number of CNVs to be analyzed, we discarded the captured germline deletions that contain 15 or fewer markers. For the remaining 356 CNVs we further excluded 180 CNVs that appeared only once, resulting in 176 reproducible CNVs that represented 63 non-redundant CNV regions. Forty six of the 63 non-redundant regions were found only in matched brother pairs and 17 regions were found in two subjects without kindred relations, suggesting the majority of the reproducible CNVs are rare

and heritable. We further removed one CNV that was detected in HapMap subjects from the final analysis. For the 46 paired-only CNV regions; one was found in three pairs, one was found in two pairs and the remaining 44 regions were found in one pair. The frequency of all the CNV described previously is below 0.01 so they can be categorized as a rare CNV. Searching on the UCSC on-line human genome database, it was identified that 22 of the 46 regions involved known genes and 14 directly disrupt the coding sequences of the genes. The hitting rate of CNV in these regions was about 48%, which is much higher than that found in common CNV regions (~16%). The numbers agree with the notion that rare genomic variants, as compared with their high frequency counterparts', are more likely to be found in functional regions in genome. The physical locations of the 22 regions as well as other features are listed in **Table 3**.

Table 3. The selected rare CNVs that disrupt known genes and appear only in match pairs.

Family	Chr	Start	End	Size	#Markers	CN[1]	Known Genes[2]
194	2	43,344,689	43,409,309	64,620	38	1	thada
162	2	133,552,472	133,581,159	28,687	26	1	nap5 intron[3]
1332	2	165,996,222	166,048,830	52,608	43	1	csrnp3
94	3	108,403,075	108,432,505	29,430	15	1	bc036229 intron
99	5	11,833,889	11,880,061	46,172	39	1	ctnnd2 intron
158	5	12,728,442	12,798,922	70,480	28	1	ay320033
133	6	65,882,337	65,977,375	95,038	82	1	eys intron
172	8	14,083,142	14,106,992	23,850	22	1	sgcz intron
30	11	84,027,229	84,049,246	22,017	20	1	dlg2 intron
126	12	51,458,700	51,474,170	15,470	19	1	krt3
227	12	75,784,790	75,859,346	74,556	47	1	csrp2
39	14	37,226,508	37,285,907	59,399	36	1	c14orf25
241	14	46,822,297	46,847,276	24,979	16	1	mdga2
90	14	66,122,799	66,202,521	79,722	27	1	gphn
103	14	98,247,896	98,263,760	15,864	15	1	c14orf177
60	15	47,268,529	47,389,665	121,136	59	1	galk2
1332	15	58,105,293	58,137,917	32,624	31	1	foxb1
1332	16	77,387,916	77,405,024	17,108	32	1	wwox intron
203	17	61,847,592	61,878,183	30,591	25	1	prkca intron
1333	18	69,164,242	69,198,678	34,436	25	1	bc071801
131	20	14,554,388	14,596,223	41,835	35	1	macrod2
15	X	10,870,478	10,894,487	24,009	17	0	ay660577

Note: (1) Copy number.
(2) The genes were identified using the UCSC genome browser.
(3) The deletions occurred only in the intron regions.

Two tumor-related genes, CTNND2 and WWOX, were found in this rare CNV category in the JHH sample set. Over-expression of CTNND2 was found in prostate cancer tissue but not in adjacent normal tissues (Burger et al., 2002). Since the deletion only affects the intron of the gene, it would not directly effect the gene's structure. The level of the gene's expression could be altered, as demonstrated in genes of p73 and WNK1 where the deletion of the intron region of genes lead to over-expression (Delaloy et al., 2008; Dominguez et al., 2006). It is interesting that the intronic sequence in WWOX gene detected in rare CNVs in **Table 3** is segmentally different from the one in **Table 2** for common CNVs, though both are in the same intron. Considering WWOX is one of the largest human genes with a length of over 1.1 mbp and located in a common fragile site (FRA16D), it may not be uncommon to find multiple deletions

including rare deletions in the locus. We observed that the patients who carry the deletion in WWOX also carry two other rare germline deletions that impair CSRNP3 on chromosome 2 and FOXB1 on chromosome 15, as seen in **Table 3**. The onset ages of the two PCa patients with the rare germline deletions were 48 and 52 years respectively, and malignance of the tumor was at high end of Gleason score 7.

Large deletion fragments in HPC subjects

Because the screening protocols for rare CNVs could miss some large fragments if the DNA sequences overlap with a common CNV, we used a different protocol to detect large deletions in HPC, which is described in Material and Method section. Under these conditions, we captured 158 large germline deletions and 28 of which appears in matched pairs included 26 non-redundant regions.Thus, the overall concurrent ratio was 0.215 (28/130), which is below the theoretic value of 1/3. Since mistaken calls for large deletions is rare, the undervalued overall concurrent ratio implies a significant portion of the detected germline deletions came were *de novo*. Eighteen of the 26 (~69%) non-redundant regions cover or reside in known genes and are listed in **Table 4**.

Table 4. The selected large CNV deletion fragments that disrupt known genes and appear in matched pairs.

Family	CN	Chr	Start	End	Length	#Markers	Known Genes
130	1	1	51,586	557,616	506,030	23	ak125248
260	1	1	245,968,920	246,259,734	290,814	219	trim58 and 7 Ors
125	1	2	133,496,643	133,632,025	135,382	129	nap5
159	1	3	60,042,906	60,252,168	209,262	214	fhit intron
213	1	5	175,398,283	175,564,576	166,293	59	ffam153b
120	1	6	119,749,084	120,051,720	302,636	169	ak097101
225	1	7	56,775,226	56,921,881	146,655	29	dq581928, dq593490
203	1	7	63,058,489	63,657,184	598,695	348	znf679
109	1	8	100,390,410	100,685,605	295,195	147	vps13b
212	1	10	67,838,185	68,066,657	228,472	165	ctnna3
107	1	10	135,102,094	135,239,874	137,780	109	cyp2e1, syce1
1510	1	12	7,886,042	8,014,492	128,450	57	slc2a14
124	1	13	55,691,894	56,712,257	1,020,363	489	prr20a to prr20e
60	1	15	47,268,529	47,389,665	121,136	59	galk2
1434	1	16	6,353,745	6,805,109	451,364	605	a2bp1
48	1	17	41,521,621	41,639,141	117,520	100	kiaa1267
1213	1	20	14,795,369	14,930,565	135,196	127	macr0d2
31	1	22	17,128,428	17,386,984	258,556	97	ggt2, dgcr6 etc

Of the 18 regions, two deletions are of particular interest; one disrupts CTNNA3 gene in 10q21 and another deletes a sequence of over 200 kb in intron 5 of FHIT gene in 3p14.2. CTNNA3 is the fifth largest human gene in a length of 1.8 mbp, is located in a common fragile site (CFS) FRA10D (Smith et al., 2006), and functionally it enhances the cell to cell contacts and adhesions mediated by beta-catenin (Janssens et al., 2001). The full length protein of CTNNA3 has 895 amino acids, based on a sequences from GeneBank (accession number NM_001127384) and the deletion knock out exons of 10 and 11. The deduced amino acid sequences indicate the deletion caused mistranslation of the protein starting from amino acid

430 and the terminates prematurely at amnio acid 440. The truncated protein has full length of beta-catenin binding domain (aa 57-146) but loss the domain for binding F-actin (aa 697-895), which could lead to the termination of the protein's function on cell to cell contacts. Reduced CTNNA3 expression is related to a malignant phenotype in local prostate cancer as well as shortened survival (Aaltomaa et al., 2005). In clinical practice, CTNNA3 is the best prognostic marker for prostate cancer -specific survival (van Oort et al., 2007). Coincidentally, clinical information indicated that the onset ages of two HPC patients who lost one functional CTNNA3 allele were 50 and 53 years old, uncommonly young ages for PCa patients.

FHIT is the tenth largest human gene and is also located in a common fragile site, FRA3B, a well known cancer susceptible region. Although the deletion occurs in intron 5 and does not disturb the gene's coding region, several reports suggested a significant risk of prostate cancer associated with DNA microsatellite and SNP variants in the same intron in the FHIT gene (Larson et al., 2005; Ding et al., 2008). Interestingly, we detected the germline deletion variants in 6 subjects and all were of Ashkenazi Jewish (AKJ) descent, representing 15.4% of the 39 AKJ samples in the studied population. An extended association study indicated that the deletion is possibly associated with hereditary prostate cancer (OR = 6.09, reported separately) in the AKJ population.

We identified the CNV states of the two large deletions on the other members in the two families, family 212 for CTNNA3 gene and family 159 for FHIT, and the results were shown in Figure 3A and 3B separately. We noticed that 'a' allele was shared in the loci of all four affected members in family 212, shown in the rectangle boxes in Figure 3A. Using the available DNA samples, we examined the deletion states for four of five members including two subjects used in array analysis in the pedigree (212-02, 212-20, 212-23 and 212-27) by real-time PCR. The data from qPCR is fully agreed with the results from the segregation analysis using microsatellite markers (data not shown). The data on FHIT gene in family 159 is inconclusive therefore one can not make convincible conclusions on the penetration of the deletion allele.

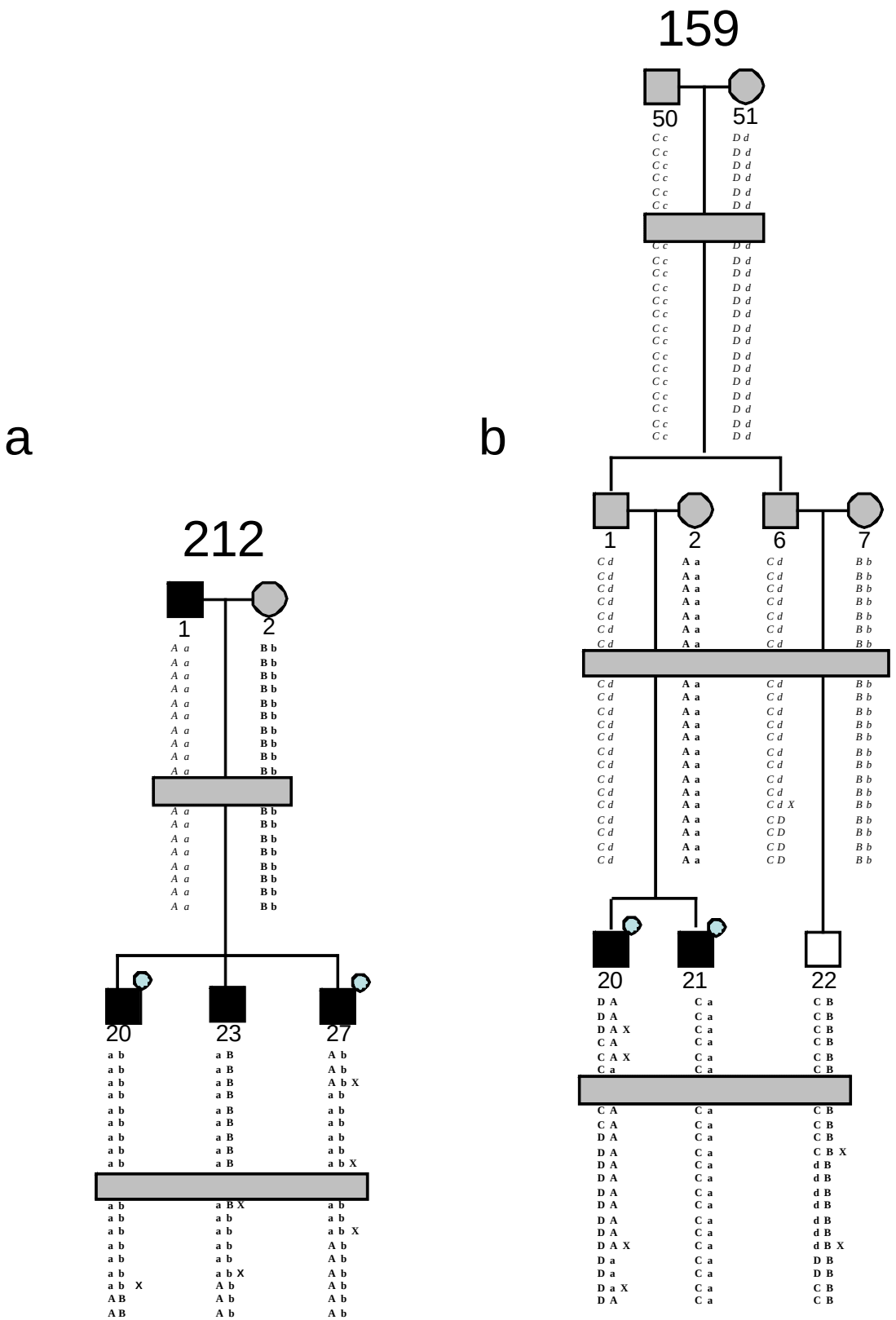
During the last several years, genome-wide screening by the advanced array technology have exponentially added more DNA variants that contribute to the susceptibility of common complex diseases. Meanwhile, a debate on whether common or rare variants make major contributions on heritable complex diseases became more intensive. With a few exceptions, common variants are believed to be unsuitable for explaining the etiologically of common complex diseases largely due to the low odd ratios (less than 1.2 in most cases) and the low phenotypic effects due to the variants' largely being unknown. In fact, it has estimated that more than 90% of the heritable components of a disease remain uncovered (reviewed by Schork et al., 2009). Most rare variants, on the other hands, are believed to have a stronger impact on the function of genes because they are likely to alter the gene product. In this study, which is focused on concurrent germline deletion, we found out that the hitting rates for known genes are 16% for a common CNV group, 48% for a rare deletions group and 69% for a large deletion group. The significantly higher hit rates in rare germline deletion has compared to the one in common CNVs support the notion that rare deleterious variants are likely to be new and have not been subjected a long, stressful selection process so they are likely to include functional genes. Large fragment deletions were also observed and are thought to be responsible for the malignance of tumors. The effect of large germline deletions on HPC was reported in the CHEK2 gene where a large deletion encompassing exons 9 and 10 conferred an increased risk of prostate cancer in Polish men (Cybulski et al., 2006).

By examining all involved genes in all the selected CNV regions (Table 1,2,3) for their relevance to cancer cell growth, we found four genes, FHIT, WWOX, CTNNA3 and CTNND2. All but

CTNND2 are located in common fragile sites, including the most extensively studied FRA3B and FRA16D where FHIT and WWOX genes located. The correlation of the enhanced cancer cell growth and altered DNA structure in common fragile site have been well documented (reviewed by Iliopoulos et. al., 2006).

Because of low allele frequency the main challenge for using an individual rare variant in an association study is the lack of compelling statistical power. The challenge can be partly overcome by pooling rare variants that are relevant to a phenotypic trait caused by the underlying molecules. Candidate genes were selected based on their functions in carcinogen metabolism, on their pathways of somatic tumorigenesis and on their roles in genome stability. The strategy has been applied in inherited colorectal adenomas and in coronary atherosclerosis (Fearnhead et al., 2004; Cohen et al., 2004). We believe the selected regions in this paper will provide supplemental components on addressing the role of rare genetic variants on the etiology in HPC. An extended study, based on the listed region from this study, revealed that a FHIT gene deletion is associated with high risk of HPC in AKJ population (reported separately). Attention should also be paid to the CTNNA3 gene deletion on chromosome 10. Early age of diagnosis and family clusters of HPC, as seen in Figure 3A, in addition to the known evidenced that under expression of the protein in PCa tissues suggests that the deletion is possibly related to high malignance and high penetrance. The aberrant protein missing exons 10 and 11 would cause the cell to not only lose contact with adjacent cells, due to the lack of the binding domain to F-actin, but also reduce the number of cadherin due to the association with the truncated protein product. The adverse effect on cell to cell contact incurred by the truncated CTNNA3 gene product could have a greater effect than reducing the same amount of the protein alone.

Figure 4



KEY RESEARCH ACCOMPLISHMENTS

1) Completed genotyping for all 447 subjects from hereditary prostate cancer families using Affymetrix 6.0 SNP array
2) Identified 1,141 germline CNVs in these subjects
3) Identified a founder germline deletion in the FHIT gene (a tumor suppressor gene) that is associated with hereditary prostate cancer risk among Ashkenazi Jews.

REPORTABLE OUTCOMES

1) Germline CNVs identified in this study population (**Supplementary Table**)
2) Germline deletion in the FHIT gene associated with hereditary prostate cancer risk among Ashkenazi Jews (**Table 1**).
3) We plan to submit 3 papers by July:
    a. A concurrence analysis of germline deletions from 208 paired PCa patients with family history
    b. An Ashkenazi Jewish founder deletion in the FHIT gene is associated with hereditary prostate cancer
    c. A novel germline deletion at CTNNA3 segregates with prostate cancer in hereditary prostate cancer families

CONCLUSION

1) We have completed the goals described in the approved Statement of Work.
2) We have identified common germline CNVs in hereditary prostate cancer (HPC) patients.
3) We identified a candidate germline CNV that is associated with hereditary prostate cancer risk among Ashkenazi Jews.
4) We tested the association of these germline CNVs with prostate cancer risk in all HPC family members.

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APPENDIX

Supplementary Table 1. Germline CNVs identified in the hereditary prostate cancer probands

					HapMap Frequency		JHH Frequency		
CNP ID	**Chromosome**	**Start**	**End**	**Length**	**Loss**	**Gain**	**Loss**	**Gain**	**Known Genes**
CNP3	1	755964	799636	43673	0.0037	0.0370	0.0045	0.0045	LOC643837
CNP4	1	1617778	1662463	44686	0.0926	0.0222	0.0700	0.0474	MMP23A, Ribosomal_S7e, SLC35E2, CDC2L1, CDC2L2
CNP6	1	8105171	8111872	6702	0.0222	0.0000	0.0045	0.0023	
CNP10010	1	8128717	8131908	3192	0.0000	0.0489	0.0023	0.0451	
CNP10	1	10293128	10300570	7443	0.0667	0.0000	0.0158	0.0023	KIF1B
CNP12	1	12768450	12805683	37234	0.1049	0.0337	0.0790	0.0135	PRAMEF1
CNP13	1	12831824	12849694	17871	0.1155	0.1235			PRAMEF2
CNP10026	1	13081670	13249634	167965	0.0078	0.0078	0.0474	0.0068	PRAMEF3, PRAMEF5, LOC649324, LOC440563, LOC645354
CNP15	1	13317495	13340609	23115	0.1565	0.0153			PRAMEF13
CNP10028	1	15149071	15151883	2813	0.0112	0.0000	0.0181	0.0000	KIAA1026
CNP10029	1	15361772	15362873	1102	0.0155	0.0000	0.0113	0.0000	TMEM51
CNP10030	1	15665011	15683808	18798	0.0148	0.0000	0.0068	0.0000	ELA2AandELA2B, dorzabo
CNP10032	1	16240718	16251918	11201	0.0000	0.0160			CLCNKB
CNP22	1	17067742	17134834	67093	0.0000	0.7820	0.0655	0.0406	LOC440570, CROCC, LOC729604
CNP10045	1	22193098	22209830	16733	0.0849	0.0000	0.0384	0.0000	ELA3B,ELA3A
CNP28	1	25465715	25534592	68878	0.3778	0.0000	0.5982	0.0000	SDHDP6, RHD, C1orf63
CNP35	1	34875241	34877078	1838	0.2259	0.0000	0.3205	0.0000	
CNP10054	1	38414624	38417452	2829	0.0272	0.0000	0.0045	0.0000	
CNP10055	1	38901191	38908792	7602	0.0111	0.0000	0.0000	0.0000	
CNP10056	1	40738766	40742251	3486	0.0498	0.0000	0.0158	0.0000	
CNP10058	1	41119794	41149087	29294	0.0000	0.0185	0.0000	0.0316	
CNP10059	1	43868287	43878235	9949	0.0000	0.0150	0.0000	0.0023	
CNP10062	1	47486248	47501675	15428	0.0000	0.0074	0.0000	0.0023	STIL
CNP10063	1	53261038	53262328	1291	0.0313	0.0000			SCP2
CNP10065	1	55074411	55078004	3594	0.0191	0.0000	0.0181	0.0000	C1orf177
CNP10068	1	59816510	59830867	14358	0.0074	0.0000	0.0000	0.0000	FLJ10986
CNP48	1	61886594	61890775	4182	0.1933	0.0000	0.2619	0.0000	
CNP53	1	64615315	64624133	8819	0.0858	0.0000	0.0226	0.0000	
CNP59	1	72528701	72535958	7258	0.1667	0.0000	0.2799	0.0000	
CNP60	1	72541504	72583736	42233	0.8815	0.0000	0.8646	0.0000	
CNP10079	1	73454531	73483916	29386	0.0000	0.0263	0.0181	0.0113	
CNP10083	1	77547460	77552420	4961	0.0148	0.0000	0.0023	0.0000	AK5
CNP10086	1	84668621	84670569	1949	0.0076	0.0000	0.0090	0.0000	
CNP10087	1	85683879	85687990	4112	0.0076	0.0000	0.0113	0.0000	LOC646626, DDAH1
CNP10093	1	92351832	92357103	5272	0.0187	0.0000			BTBD8
CNP71	1	94903354	94927987	24634	0.0222	0.0000	0.0068	0.0000	
CNP10097	1	102096209	102098748	2540	0.0149	0.0000	0.0135	0.0000	OLFM3

CNP76	1	103910761	103960907	50147	0.0000	0.0970	0.0000	0.1106	Actin, RNPC3
CNP10104	1	105634380	105641635	7256	0.0155	0.0000	0.0135	0.0045	
CNP79	1	105820728	105823898	3171	0.6815	0.0000	0.5350	0.0000	
CNP10106	1	105936885	105938440	1556	0.0186	0.0000	0.0090	0.0000	
CNP10107	1	105969819	106016548	46730	0.0223	0.0000	0.0045	0.0000	
CNP81	1	106110789	106116611	5823	0.0370	0.0000	0.0181	0.0000	
CNP10109	1	107023241	107025005	1765	0.0301	0.0000	0.0090	0.0000	
CNP84	1	108535758	108539019	3262	0.4179	0.0000	0.3589	0.0000	SLC25A24
CNP10111	1	108729983	108787720	57738	0.0269	0.0090	0.0497	0.0700	DUF1220
CNP10112	1	109298377	109299668	1292	0.0410	0.0000	0.0068	0.0045	CLCC1
CNP88	1	110025907	110044476	18570	0.8550	0.0000	0.8826	0.0000	GSTM2, GSTM1
CNP91	1	111179088	111189749	10662	0.2156	0.0000	0.1603	0.0000	
CNP10118	1	111629849	111637017	7169	0.0111	0.0000	0.0023	0.0000	CHIA, RP11-165H20
CNP10119	1	111730660	111734750	4091	0.0227	0.0000	0.0429	0.0000	LOC441897
CNP94	1	112497200	112498913	1714	0.3741	0.0000	0.4876	0.0000	
CNP10125	1	119916400	119951038	34639	0.0112	0.0037	0.0135	0.0023	LOC644237, LOC644242, LOC128102, LOC391081
CNP10126	1	146273899	146275557	1659	0.0112	0.0000	0.0000	0.0000	NBPF14
CNP10127	1	146780429	147056085	275657	0.0188	0.0075	0.0068	0.0339	NBPF15, LOC645126, LOC728936, LOC729118
CNP104	1	147303148	147526040	222893	0.2259	0.0222	0.2212	0.0451	LOC729179,RNU1P9, LOC729182, NBPF17P
CNP10138	1	149603323	149664502	61180	0.0000	0.0222	0.0000	0.0045	PSMB4, POGZ, SELENBP1
CNP109	1	150822330	150853218	30889	0.7296	0.0000	0.8826	0.0000	LCE3B, LCE3C
CNP10140	1	150915736	150923166	7431	0.0000	0.0187	0.0181	0.0339	
CNP110	1	151028547	151035324	6778	0.2963	0.0000	0.5440	0.0000	
CNP10145	1	151940298	151959872	19575	0.0000	0.0736	0.0090	0.0519	
CNP10146	1	153455784	153467684	11901	0.0000	0.0335			GBAP, MTX1P, yanira
CNP113	1	153927851	153929981	2131	0.2717	0.0000			GON4L, DAP3
CNP114	1	156783620	156787041	3422	0.0333	0.0000	0.0181	0.0000	OR6Y1
CNP118	1	159778034	159906183	128150	0.0000	0.9924			FCGR2B, FCGR2C, FCGR3A, FCGR3B
CNP10158	1	163688498	163690794	2297	0.0185	0.0000	0.0023	0.0000	
CNP120	1	164451105	164460994	9890	0.0000	0.0830	0.0000	0.0293	
CNP10161	1	166355739	166358038	2300	0.0074	0.0000	0.0000	0.0000	GPR161
CNP122	1	167500598	167508390	7793	0.3037	0.0000			NME7
CNP10163	1	168634270	168653829	19560	0.0148	0.0000	0.0023	0.0000	SCYL1BP1
CNP124	1	173063179	173068463	5285	0.2815	0.0000	0.2009	0.0000	RABGAP1L
CNP10168	1	176926933	176940811	13879	0.0111	0.0000	0.0045	0.0000	
CNP10170	1	177220369	177243352	22984	0.0074	0.0000	0.0023	0.0000	
CNP128	1	177597151	177599938	2788	0.1963	0.0000	0.1625	0.0000	
CNP10174	1	182046713	182052162	5450	0.0000	0.0112	0.0023	0.0384	RGL1
CNP10175	1	185564993	185567314	2322	0.0116	0.0000	0.0135	0.0000	
CNP10176	1	187293847	187297986	4140	0.0196	0.0000	0.0384	0.0000	
CNP10177	1	187353623	187359115	5493	0.0230	0.0000	0.0068	0.0000	

CNP134	1	187593758	187719766	126009	0.0222	0.0000	0.0158	0.0000	
CNP10181	1	188236989	188253049	16061	0.0149	0.0000	0.0045	0.0000	
CNP10184	1	189983338	189992781	9444	0.0112	0.0000	0.0000	0.0000	
CNP141	1	190095692	190133873	38182	0.0333	0.0000	0.0090	0.0000	
CNP10186	1	191927641	191976999	49359	0.0111	0.0000	0.0023	0.0000	
CNP10187	1	193204702	193213877	9176	0.0111	0.0000	0.0045	0.0000	
CNP10188	1	193280600	193285922	5323	0.0190	0.0000	0.0090	0.0000	
CNP145	1	193676328	193682368	6041	0.0407	0.0074	0.0135	0.0158	
CNP147	1	194997658	195068695	71038	0.4682	0.0000	0.3679	0.0000	CFHR1, CFHR4, CFHR3
CNP148	1	195089940	195168372	78433	0.0407	0.0074	0.0339	0.0113	
CNP10199	1	197215222	197223208	7987	0.0190	0.0000	0.0135	0.0000	
CNP151	1	197378049	197380463	2415	0.2741	0.0000	0.3183	0.0000	
CNP10200	1	202204481	202212021	7541	0.0111	0.0000	0.0158	0.0000	
CNP158	1	208148236	208150607	2372	0.8358	0.0000			
CNP10203	1	208671369	208679147	7779	0.0222	0.0000	0.0023	0.0000	HHAT
CNP10204	1	211071638	211077059	5422	0.0667	0.0000	0.0767	0.0000	LOC149643
CNP10205	1	212919913	212922145	2233	0.0116	0.0000	0.0045	0.0000	
CNP160	1	213560092	213565727	5636	0.0407	0.0000	0.0293	0.0000	
CNP10207	1	215356748	215360951	4204	0.0148	0.0000	0.0113	0.0000	
CNP10208	1	216484875	216489763	4889	0.0075	0.0000	0.0023	0.0000	
CNP10210	1	219812673	219820232	7560	0.0336	0.0000	0.0045	0.0000	
CNP164	1	221083948	221090227	6280	0.1413	0.0000	0.2799	0.0000	DISP1
CNP10211	1	223725840	223750819	24980	0.0000	0.0148	0.0045	0.0045	ENAH
CNP168	1	227883479	227886819	3341	0.4662	0.0000			
CNP10215	1	229602207	229609275	7069	0.0075	0.0000	0.0248	0.0000	EGLN1
CNP10218	1	232770219	232774658	4440	0.0222	0.0000	0.0000	0.0000	
CNP10220	1	235190798	235198134	7337	0.0000	0.0149	0.0000	0.0090	
CNP174	1	236918890	236922717	3828	0.5281	0.0000			
CNP10226	1	243505832	243509159	3328	0.0311	0.0000	0.0000	0.0023	KIF26B
CNP10227	1	243703665	243713527	9863	0.0148	0.0000	0.0339	0.0000	KIF26B
CNP10229	1	244095685	244103915	8231	0.0074	0.0000	0.0090	0.0000	SMYD3
CNP180	1	246687782	246702344	14563	0.0000	0.3237			
CNP182	1	246815817	246863836	48020	0.3457	0.0000	0.2573	0.0000	OR2T10, OR2T11
CNP183	1	246933867	246939281	5415	0.2082	0.0000	0.0451	0.0000	
CNP186	2	4191739	4201042	9304	0.1338	0.0000			
CNP189	2	6215763	6225305	9543	0.0632	0.0000	0.0045	0.0000	
CNP10245	2	10619971	10622306	2336	0.0137	0.0000	0.0068	0.0000	
CNP10247	2	14623720	14627544	3825	0.0338	0.0000	0.1242	0.0000	
CNP10252	2	18037156	18056737	19582	0.0112	0.0000	0.0068	0.0000	KCNS3
CNP200	2	24460486	24464632	4147	0.0669	0.0000	0.0587	0.0000	
CNP201	2	26230008	26232251	2244	0.0409	0.0000	0.0113	0.0000	

CNP10259	2	29495382	29497726	2345	0.0305	0.0038	0.0090	0.0226	ALK
CNP207	2	34552823	34590561	37739	0.2119	0.0000	0.5688	0.0000	Transposase
CNP10266	2	34917577	34920174	2598	0.0115	0.0000	0.0248	0.0000	
CNP209	2	35435499	35458674	23176	0.0297	0.0000	0.0113	0.0000	
CNP211	2	35831294	35841451	10158	0.7435	0.0000			
CNP212	2	36190123	36193058	2936	0.0892	0.0000	0.0203	0.0000	
CNP215	2	38727303	38730104	2802	0.0299	0.0000			
CNP10274	2	38809366	38825785	16420	0.0000	0.0373	0.0000	0.1287	SFRS7, GALM
CNP10276	2	40617671	40622406	4736	0.0207	0.0000	0.0181	0.0045	
CNP10277	2	40780879	40803106	22228	0.0112	0.0000	0.0023	0.0000	
CNP216	2	41091947	41099391	7445	0.1896	0.0000	0.1490	0.0000	DUF1725
CNP10279	2	42300861	42306117	5257	0.0113	0.0000	0.0135	0.0000	EML4
CNP10280	2	44680343	44682239	1897	0.0307	0.0000			C2orf34
CNP10282	2	46549602	46551188	1587	0.0321	0.0000	0.0090	0.0000	LOC388946
CNP221	2	49389272	49394694	5423	0.1301	0.0000	0.0813	0.0000	
CNP223	2	52605074	52635046	29973	0.5167	0.0000	0.4628	0.0000	
CNP225	2	55768294	55792083	23790	0.0000	0.0483	0.0113	0.0045	PNPT1
CNP10292	2	56178950	56181532	2583	0.0074	0.0037	0.0090	0.0113	CCDC85A
CNP10299	2	67614459	67619396	4938	0.0301	0.0000	0.0339	0.0000	
CNP10303	2	73729307	73782394	53088	0.0000	0.0186	0.0000	0.0068	NAT8B, LOC200420
CNP10307	2	75632488	75663776	31289	0.0000	0.0149	0.0000	0.0000	TMEM166
CNP10308	2	75675413	75767880	92468	0.0000	0.0074	0.0000	0.0000	MRPL19, TMEM166, C2orf3
CNP10310	2	77830206	77850174	19969	0.0000	0.0074	0.0000	0.0000	
CNP10311	2	78555584	78575410	19827	0.0112	0.0000	0.0090	0.0000	CYCSP6
CNP243	2	79184286	79195607	11322	0.0000	0.1137			
CNP10315	2	81665692	81669805	4114	0.0149	0.0000	0.0045	0.0000	
CNP248	2	87227404	87267503	40100	0.0112	0.0372	0.0113	0.0519	RMND5A
CNP250	2	87367890	87376453	8564	0.6190	0.0000			
CNP251	2	87408824	87411772	2949	0.0115	0.0268	0.0316	0.0361	
CNP253	2	87600933	87609093	8161	0.5692	0.0000	0.7133	0.0000	MGC4677
CNP10324	2	87668332	87753000	84669	0.0188	0.0301	0.0519	0.0474	DUF565, MGC4677
CNP10325	2	88093546	88111932	18387	0.0000	0.0075	0.0023	0.0000	KRCC1
CNP257	2	89636367	89912071	275705	0.1208	0.0000	0.0587	0.0000	V-set, IGKV3D-20, IGKV3D-11, IGKV3D-7, IGKV3D-15, IGKV2D-24, IGKV1D-12, IGKV1D-13, IGKV2D-28, IGKV6D-21, IGKV1D-16, IGKV1D-43, IGKV1D-17, IGKV1D-8
CNP10346	2	95094701	95099193	4493	0.0314	0.0000	0.0045	0.0000	
CNP10348	2	97194115	97210579	16465	0.0113	0.0038	0.0090	0.0113	ANKRD36
CNP262	2	97507179	97528142	20964	0.6320	0.0000	0.8488	0.0000	KIAA1641
CNP10352	2	101763391	101766764	3374	0.0112	0.0000	0.0451	0.0000	MAP4K4
CNP10354	2	105714544	105717641	3098	0.0150	0.0000	0.0203	0.0000	
CNP267	2	106247145	106251789	4645	0.5836	0.0000	0.5305	0.0000	

CNP10359	2	110173879	110519409	345531	0.0037	0.0037	0.0271	0.0045	MALL,RNase_PH_C, Actin, LOC205251,NPHP
CNP10360	2	111785250	111912704	127455	0.0000	0.0074	0.0000	0.0271	DUF565, LOC541471,PAFAH1P2, WD40
CNP10361	2	113178870	113195358	16489	0.0074	0.0000	0.0023	0.0000	NT5DC4
CNP276	2	115112891	115117469	4579	0.0595	0.0000	0.0000	0.0000	
CNP10365	2	115252786	115258540	5755	0.0187	0.0000	0.0068	0.0000	
CNP10367	2	117445778	117452675	6898	0.0189	0.0000	0.0023	0.0000	
CNP10368	2	117489208	117508223	19016	0.0000	0.0225	0.0000	0.0135	
CNP10369	2	119762004	119766312	4309	0.0075	0.0000	0.0158	0.0000	LOC130355
CNP279	2	123192888	123198711	5824	0.2761	0.0000	0.2054	0.0000	
CNP10373	2	125368402	125374828	6427	0.0234	0.0000	0.2844	0.0000	CNTNAP5
CNP10375	2	128538342	128543406	5065	0.0113	0.0000	0.0113	0.0000	
CNP284	2	129354948	129356767	1820	0.2602	0.0000	0.3431	0.0000	
CNP10378	2	129958973	129963303	4331	0.0232	0.0000	0.0384	0.0339	
CNP286	2	130265745	130275716	9972	0.1078	0.0000	0.0429	0.0000	
CNP287	2	130510353	130539705	29353	0.8543	0.0000			LOC440905
CNP10382	2	131357910	131360298	2389	0.0121	0.0000	0.0113	0.0000	ARHGEF4
CNP10383	2	131809502	131812910	3409	0.0336	0.0075	0.0135	0.0790	PLEKHB2, FLJ30428
CNP289	2	131938478	131942838	4361	0.2932	0.0000	0.1309	0.0000	LOC646836
CNP290	2	132997802	133000736	2935	0.0000	0.0520	0.0068	0.0203	GPR39
CNP10387	2	133189998	133193035	3038	0.0074	0.0000	0.0090	0.0023	DUF1725
CNP10388	2	135909249	135949021	39773	0.0000	0.0186	0.0000	0.0000	ZRANB3
CNP10390	2	138225667	138228819	3153	0.0491	0.0000	0.0181	0.0000	
CNP10393	2	141971752	141973472	1721	0.0154	0.0000	0.0045	0.0000	LRP1B
CNP296	2	146580874	146583404	2531	0.5911	0.0000	0.5892	0.0000	
CNP10398	2	150739697	150745976	6280	0.0239	0.0000	0.0790	0.0000	
CNP10400	2	153378432	153505030	126599	0.0075	0.0000	0.0068	0.0000	
CNP10403	2	159418942	159438342	19401	0.0038	0.0189	0.0497	0.0045	OR7E89P,OR7E28P
CNP10405	2	164351734	164353370	1637	0.0930	0.0000	0.0745	0.0000	
CNP313	2	172543089	172548631	5543	0.0526	0.0000			SLC25A12, HAT1
CNP10410	2	174249122	174254919	5798	0.0074	0.0000	0.0045	0.0000	
CNP315	2	174301193	174305814	4622	0.1523	0.0000			
CNP319	2	179775437	179787389	11953	0.4023	0.0000			SESTD1
CNP320	2	180126456	180130382	3927	0.1530	0.0000			KIAA1604, ZNF533
CNP323	2	183794037	183797391	3355	0.0409	0.0000	0.0677	0.0000	
CNP10417	2	184502759	184510686	7928	0.0113	0.0000	0.0926	0.0000	
CNP328	2	184965298	184973074	7777	0.0595	0.0000	0.0248	0.0000	
CNP329	2	189276201	189287574	11374	0.0558	0.0000	0.0203	0.0000	
CNP10426	2	194295401	194306617	11217	0.0078	0.0000	0.0000	0.0000	
CNP10429	2	195022965	195034089	11125	0.0151	0.0000			
CNP10431	2	199887215	199890802	3588	0.0117	0.0000	0.0045	0.0000	SATB2
CNP332	2	203004020	203020446	16427	0.1375	0.0000	0.0226	0.0000	BMPR2

CNP333	2	203608045	203610291	2247	0.1183	0.0000			
CNP10437	2	205366265	205391991	25727	0.0000	0.0075	0.0023	0.0090	PARD3B
CNP337	2	208063423	208067581	4159	0.1236	0.0000	0.2889	0.0000	
CNP10440	2	211480395	211486620	6226	0.0190	0.0000	0.0068	0.0000	
CNP340	2	212894794	212900057	5264	0.0483	0.0000	0.1467	0.0000	ERBB4
CNP10445	2	226665007	226669662	4656	0.0297	0.0000	0.0203	0.0000	
CNP10446	2	227051032	227054312	3281	0.0113	0.0000	0.0451	0.0000	
CNP10453	2	240961801	240970089	8289	0.0077	0.0000	0.0090	0.0316	
CNP10456	2	242669783	242683188	13406	0.0224	0.0037	0.0926	0.0068	LOC728323, LOC728935
CNP360	3	205022	207800	2779	0.4630	0.0000			
CNP10458	3	1009997	1014189	4193	0.0187	0.0000	0.0045	0.0000	
CNP363	3	1658250	1666567	8318	0.0444	0.0000	0.0045	0.0000	
CNP10460	3	1757522	1762585	5064	0.0187	0.0000	0.0564	0.0000	
CNP10461	3	1888098	1900851	12754	0.0074	0.0000	0.0000	0.0000	
CNP364	3	4167639	4172015	4377	0.0444	0.0000			SUMF1
CNP368	3	6200911	6215260	14350	0.0259	0.0000	0.0090	0.0000	
CNP369	3	6626128	6628332	2205	0.0889	0.0000	0.2867	0.0000	
CNP10470	3	6744713	6748970	4258	0.0154	0.0000	0.0113	0.0000	
CNP10479	3	13682416	13684365	1950	0.0149	0.0000	0.0090	0.0000	
CNP379	3	17504952	17519017	14066	0.1199	0.0000	0.0542	0.0000	TBC1D5
CNP10489	3	24083075	24089943	6869	0.0074	0.0000	0.0113	0.0000	NR1D2
CNP10492	3	25825784	25829901	4118	0.0111	0.0000	0.0068	0.0000	
CNP385	3	26409128	26414347	5220	0.0778	0.0074	0.1828	0.0113	
CNP10496	3	28785441	28791112	5672	0.0154	0.0000	0.0226	0.0045	
CNP10498	3	29013259	29016700	3442	0.0149	0.0000	0.0203	0.0000	
CNP10499	3	30042734	30046449	3716	0.0304	0.0000	0.0068	0.0000	
CNP10500	3	30886154	30888645	2492	0.0151	0.0000	0.0090	0.0000	GADL1
CNP10501	3	30967806	30973751	5946	0.0303	0.0000	0.0023	0.0000	
CNP399	3	37957108	37961932	4825	0.0815	0.0000	0.1603	0.0000	CTDSPL
CNP10506	3	39174068	39188061	13994	0.0074	0.0000	0.0248	0.0000	
CNP10510	3	41755151	41763499	8349	0.0187	0.0000	0.0135	0.0000	ULK4
CNP406	3	46776821	46824285	47465	0.2778	0.0000	0.1354	0.0000	TESSP5andTSP50
CNP413	3	53003416	53016559	13144	0.0741	0.0000			SFMBT1
CNP10517	3	57933869	57952991	19123	0.0111	0.0000	0.0135	0.0000	
CNP10523	3	62687720	62690900	3181	0.0386	0.0000	0.0000	0.0000	CADPS
CNP10525	3	63108165	63110809	2645	0.0233	0.0039	0.0023	0.0203	
CNP422	3	65164275	65185492	21218	0.0889	0.0000	0.1332	0.0023	
CNP10534	3	72651057	72655335	4279	0.0192	0.0000	0.0113	0.0000	
CNP10535	3	74230849	74234561	3713	0.0375	0.0000	0.0113	0.0000	
CNP429	3	75509797	75627866	118070	0.0296	0.0000	0.1783	0.0000	LOC728135, LOC728156, FAM86D, LOC339879
CNP431	3	75655239	75669495	14257	0.7433	0.0000	0.7156	0.0000	

CNP432	3	75695864	75703585	7722	0.0260	0.0000	0.1896	0.0000	
CNP10538	3	77910146	77924562	14417	0.0154	0.0000	0.0090	0.0000	
CNP10541	3	81992028	82006436	14409	0.0000	0.0074	0.0000	0.0113	
CNP435	3	82955469	82955733	265	0.1466	0.0000	0.1196	0.0000	
CNP437	3	84782483	84784826	2344	0.2268	0.0000	0.2032	0.0000	
CNP10548	3	87974966	87984943	9978	0.0173	0.0000	0.0181	0.0000	
CNP10549	3	89477282	89502071	24790	0.0112	0.0000	0.1196	0.0000	EPHA3
CNP10550	3	89619146	89629707	10562	0.0116	0.0000	0.0158	0.0000	
CNP444	3	89754371	89756830	2460	0.0407	0.0000	0.0451	0.0000	
CNP450	3	99370181	99402053	31873	0.8958	0.0000	0.8307	0.0000	OR5H15
CNP451	3	100427148	100432111	4964	0.1481	0.0000	0.4018	0.0000	
CNP452	3	100690157	100691151	995	0.9926	0.0000	0.9865	0.0000	
CNP10560	3	102152207	102155916	3710	0.0311	0.0000	0.0293	0.0000	ABI3BP
CNP10565	3	115506749	115509270	2522	0.0074	0.0000	0.0000	0.0000	VSIG9
CNP458	3	116143282	116151640	8359	0.2156	0.0000	0.0609	0.0000	ZBTB20
CNP10568	3	117689415	117698429	9015	0.0155	0.0000	0.0068	0.0000	
CNP10572	3	120834088	120836628	2541	0.0270	0.0000	0.0474	0.0000	
CNP10574	3	126926298	126941452	15155	0.0112	0.0187	0.0226	0.0903	
CNP462	3	127156073	127158653	2581	0.3552	0.0000			LOC200810
CNP463	3	127194960	127204552	9593	0.0815	0.0000	0.0248	0.0023	
CNP468	3	129878180	129895021	16842	0.0000	0.0741	0.0000	0.1558	RPN1
CNP469	3	131246388	131288926	42539	0.4148	0.0000	0.6230	0.0023	
CNP474	3	133475463	133478374	2912	0.3633	0.0000			
CNP10588	3	136325315	136327533	2219	0.0415	0.0000	0.0339	0.0000	EPHB1
CNP10589	3	138510648	138525910	15263	0.0297	0.0000	0.0248	0.0000	
CNP10592	3	145765733	145770405	4673	0.0338	0.0000	0.0045	0.0000	
CNP493	3	150446084	150450807	4724	0.0926	0.0000	0.0790	0.0000	
CNP10599	3	153829784	153838892	9109	0.0148	0.0000	0.0158	0.0000	
CNP10601	3	156963790	156974871	11082	0.0000	0.0111	0.0000	0.0135	C3orf33
CNP10602	3	158822082	158824376	2295	0.0111	0.0000	0.0000	0.0000	C3orf55
CNP10607	3	161839634	161841803	2170	0.0111	0.0000	0.0000	0.0000	
CNP10610	3	163620294	163625399	5106	0.0390	0.0000	0.0993	0.0000	
CNP504	3	163699323	163709653	10331	0.1000	0.0000	0.0090	0.0000	
CNP505	3	163995351	164106575	111225	0.7852	0.0000	0.5508	0.0000	DUF1725
CNP10616	3	166523806	166564633	40828	0.0149	0.0000	0.0293	0.0000	
CNP512	3	166751814	166779809	27996	0.0444	0.0000	0.0181	0.0000	
CNP514	3	167539435	167547514	8080	0.0815	0.0000	0.0406	0.0000	
CNP515	3	167573295	167576883	3589	0.0000	0.0420			
CNP10620	3	168005537	168013637	8101	0.0000	0.0112	0.0000	0.0090	
CNP519	3	174692475	174698428	5954	0.0259	0.0000	0.0158	0.0000	NLGN1
CNP10622	3	174723329	174772374	49046	0.0000	0.0148	0.0000	0.0361	NLGN1

CNP10627	3	178176283	178191496	15214	0.0111	0.0000	0.0000	0.0000	
CNP10628	3	186584116	186589711	5596	0.0111	0.0000	0.0090	0.0000	MAP3K13
CNP526	3	187895555	187898214	2660	0.0335	0.0000	0.0271	0.0000	
CNP530	3	190846372	190847332	961	0.3593	0.0000			TP73L
CNP536	3	194360656	194365597	4942	0.8815	0.0000	0.8668	0.0000	
CNP10647	3	198792686	198798533	5848	0.0340	0.0000	0.0361	0.0000	LOC220729
CNP540	3	199329613	199334102	4490	0.2556	0.0000			
CNP10649	4	3439242	3443433	4192	0.0000	0.0337	0.0000	0.0203	DOK7
CNP10652	4	5946326	5948393	2068	0.0000	0.0076	0.0000	0.0339	
CNP10655	4	8216784	8224819	8036	0.0075	0.0000	0.0068	0.0000	
CNP548	4	8981399	9024929	43531	0.0000	0.1353	0.0000	0.0203	
CNP550	4	9024930	9066074	41145	0.0496	0.0878	0.0158	0.0135	
CNP551	4	9070328	9088443	18116	0.7424	0.0114			
CNP554	4	9823254	9844366	21113	0.8178	0.0000	0.9029	0.0000	
CNP10664	4	9881882	9884031	2150	0.0186	0.0000	0.0384	0.0000	
CNP555	4	10001452	10009766	8315	0.2156	0.0000	0.3634	0.0000	
CNP559	4	11986711	11988353	1643	0.0260	0.0000	0.0181	0.0000	
CNP10671	4	15369169	15377565	8397	0.0186	0.0000	0.0113	0.0000	
CNP10672	4	16645288	16648472	3185	0.0114	0.0000	0.0023	0.0000	LOC729006
CNP10674	4	18697657	18733331	35675	0.0112	0.0000	0.0068	0.0000	
CNP564	4	20165809	20173040	7232	0.0297	0.0000	0.0023	0.0000	CENP-B_N, SLIT2
CNP565	4	20981137	20985949	4813	0.2974	0.0000			KCNIP4
CNP10679	4	21657731	21679799	22069	0.0075	0.0000	0.0023	0.0135	
CNP567	4	22884297	22889218	4922	0.2406	0.0000			
CNP10680	4	25111151	25117108	5958	0.0112	0.0000	0.0023	0.0023	
CNP10681	4	25323324	25339974	16651	0.0112	0.0000	0.0023	0.0000	KIAA0746
CNP10684	4	28251431	28339922	88492	0.0074	0.0000	0.0023	0.0000	
CNP10685	4	28553137	28561579	8443	0.0149	0.0000	0.0045	0.0000	
CNP10687	4	28895502	28907251	11750	0.0000	0.0112	0.0000	0.0248	
CNP573	4	32122898	32126696	3799	0.3962	0.0000			
CNP574	4	33055531	33062581	7051	0.0595	0.0000	0.0361	0.0000	
CNP575	4	34455420	34500578	45159	0.2937	0.0000	0.5079	0.0000	
CNP10692	4	35524746	35527802	3057	0.0506	0.0000	0.0135	0.0068	
CNP10694	4	39262956	39265557	2602	0.0189	0.0000	0.0045	0.0090	RVT_1, C4orf34
CNP10695	4	39380804	39389728	8925	0.0116	0.0000	0.0361	0.0248	HIP2
CNP10697	4	41100891	41102324	1434	0.0075	0.0000	0.0023	0.0023	DKFZP686A01247
CNP10698	4	41152488	41161610	9123	0.0075	0.0000	0.0135	0.0023	DKFZP686A01247
CNP10700	4	43433755	43436627	2873	0.0114	0.0000	0.0384	0.0000	
CNP581	4	43716642	43720503	3862	0.0558	0.0000	0.0135	0.0000	
CNP10701	4	44018589	44025731	7143	0.0112	0.0000	0.0068	0.0000	KCTD8
CNP10705	4	48674391	48688134	13744	0.0076	0.0000	0.0000	0.0135	FLJ21511

CNP10706	4	53765718	53774999	9282	0.0188	0.0000	0.0113	0.0090	SCFD2
CNP591	4	57238077	57239259	1183	0.0558	0.0000	0.0113	0.0000	HOP
CNP10709	4	57951132	57953111	1980	0.0460	0.0000	0.0000	0.0000	
CNP10711	4	59656670	59670688	14019	0.0000	0.0300	0.0000	0.0587	
CNP10712	4	60007544	60013040	5497	0.0000	0.0078			
CNP596	4	63352531	63354257	1727	0.3636	0.0000	0.3521	0.0000	
CNP10714	4	63926525	63935689	9165	0.0075	0.0000	0.0158	0.0135	
CNP597	4	64380064	64390818	10755	0.2788	0.0000	0.4650	0.0000	
CNP10718	4	65502562	65522613	20052	0.0224	0.0000	0.0158	0.0000	
CNP10720	4	66271146	66312360	41215	0.0000	0.0075	0.0000	0.0135	
CNP10721	4	66485479	66488419	2941	0.0155	0.0000	0.0135	0.0000	
CNP10722	4	67063196	67075558	12363	0.0117	0.0000	0.0113	0.0226	
CNP602	4	68964800	68970737	5938	0.6641	0.0000			
CNP603	4	69043083	69168574	125492	0.6381	0.0000	0.5530	0.0000	UGT2B17, TMPRSS11E, UGT2B29P
CNP10728	4	69713484	69751804	38321	0.0000	0.0149	0.0113	0.0045	UGT2B10
CNP605	4	70162233	70273689	111457	0.3755	0.0000	0.2867	0.0000	LOC642496, UGT2B28
CNP10734	4	71262854	71283637	20784	0.0149	0.0000	0.0045	0.0068	SMR3A,SMR3B
CNP10735	4	72164818	72167328	2511	0.0114	0.0000	0.0045	0.0474	
CNP10737	4	73639702	73644176	4475	0.0372	0.0000	0.0181	0.0023	ADAMTS3
CNP10739	4	75299976	75301070	1095	0.0226	0.0000	0.0158	0.0000	MTHFD2L
CNP10740	4	77508808	77511390	2583	0.0198	0.0000			FLJ25770
CNP10743	4	78001593	78006231	4639	0.0297	0.0000	0.0000	0.0000	
CNP10744	4	78495579	78500367	4789	0.0000	0.0112	0.0000	0.0113	CCNG2
CNP10746	4	83856392	83860850	4459	0.0149	0.0000	0.0068	0.0000	SCD5
CNP10747	4	85302053	85308324	6272	0.0112	0.0000	0.0045	0.0000	
CNP10748	4	85346286	85351938	5653	0.0192	0.0000	0.0158	0.0000	
CNP620	4	87195118	87198968	3851	0.1301	0.0000	0.1016	0.0000	MAPK10
CNP10754	4	89243112	89300463	57352	0.0000	0.0074	0.0000	0.0000	ABCG2
CNP10755	4	91506179	91510539	4361	0.0075	0.0000	0.0406	0.0474	MGC48628
CNP10756	4	92692337	92697344	5008	0.0076	0.0000	0.0293	0.0181	
CNP10757	4	93631395	93637602	6208	0.0076	0.0000	0.0023	0.0000	GRID2
CNP10760	4	97539253	97541426	2174	0.0276	0.0000	0.0361	0.0000	
CNP638	4	98391437	98404155	12719	0.0483	0.0000	0.0023	0.0000	MGC46496
CNP10764	4	101293833	101320088	26256	0.0075	0.0000	0.0023	0.0135	
CNP641	4	104426263	104467383	41121	0.0520	0.0000	0.0203	0.0000	
CNP10767	4	104961839	104980713	18875	0.0112	0.0000	0.0158	0.0293	
CNP10768	4	106929541	106936543	7003	0.0225	0.0000	0.0023	0.0000	GSTCD, INTS12
CNP646	4	107162376	107165884	3509	0.2547	0.0000			
CNP10769	4	108285200	108294716	9517	0.0342	0.0000	0.0542	0.0045	DKK2
CNP652	4	108731204	108733947	2744	0.0409	0.0000			
CNP10774	4	111517080	111519963	2884	0.0153	0.0000	0.0045	0.0293	

CNP657	4	112516868	112525864	8997	0.0372	0.0000	0.0113	0.0000	
CNP10776	4	112896236	112900044	3809	0.0074	0.0000	0.0045	0.0000	
CNP662	4	115394772	115401624	6853	0.6580	0.0000	0.6479	0.0000	
CNP663	4	115727615	115729903	2289	0.3358	0.0000			
CNP10779	4	116392056	116395574	3519	0.1059	0.0000	0.1106	0.0000	
CNP10780	4	117866565	117869001	2437	0.0076	0.0000	0.0203	0.0858	
CNP10782	4	120824308	120828716	4409	0.0075	0.0000	0.0000	0.0429	
CNP10784	4	121743029	121762869	19841	0.0074	0.0000	0.0090	0.0000	PRDM5
CNP668	4	122501918	122504766	2849	0.1822	0.0000	0.1377	0.0000	GPR103
CNP10789	4	126826946	126843898	16953	0.0000	0.0074	0.0045	0.0113	
CNP10791	4	132165824	132577643	411820	0.0000	0.0074	0.0000	0.0068	
CNP10794	4	137578497	137583646	5150	0.0152	0.0000	0.0068	0.0203	
CNP682	4	138311645	138312864	1220	0.3197	0.0000	0.3093	0.0000	
CNP10798	4	138401883	138411420	9538	0.0224	0.0000	0.0293	0.0158	
CNP10799	4	138543995	138549443	5449	0.0076	0.0000	0.0090	0.0023	
CNP687	4	140452973	140457810	4838	0.0297	0.0000	0.0293	0.0000	NARG1
CNP10801	4	143835324	143839399	4076	0.0074	0.0000	0.0090	0.0587	
CNP10804	4	144938147	144965448	27302	0.0000	0.0260	0.0000	0.0113	
CNP10807	4	145140024	145144387	4364	0.0510	0.0078	0.0181	0.0293	GYPB
CNP10809	4	145220925	145232498	11574	0.0232	0.0116	0.0090	0.0271	
CNP699	4	152095801	152103748	7948	0.1524	0.0000	0.0474	0.0000	LRBA
CNP10814	4	153010979	153014149	3171	0.0824	0.0000	0.1061	0.0000	
CNP10815	4	153209736	153212189	2454	0.0800	0.0000	0.0339	0.0000	
CNP703	4	156022455	156022528	74	0.5509	0.0000	0.0971	0.0000	
CNP704	4	156813718	156817445	3728	0.0335	0.0000	0.0090	0.0000	GUCY1A3
CNP10824	4	157188133	157192659	4527	0.0228	0.0000	0.0722	0.0000	
CNP709	4	158949012	158950828	1817	0.0372	0.0000	0.0181	0.0000	
CNP712	4	161272220	161286569	14350	0.0335	0.0000	0.0609	0.0000	
CNP714	4	162083345	162151100	67756	0.0000	0.0604	0.9797	0.0000	
CNP10834	4	162413794	162424561	10768	0.0075	0.0000	0.0248	0.0271	
CNP10836	4	164173911	164176879	2969	0.0149	0.0000	0.0000	0.0000	
CNP10843	4	169055017	169080681	25665	0.0149	0.0149	0.0045	0.0068	
CNP10845	4	171504657	171509731	5075	0.0486	0.0000			
CNP724	4	172611459	172614508	3050	0.8106	0.0000	0.8916	0.0000	
CNP726	4	173661522	173665218	3697	0.9135	0.0000	0.9549	0.0000	GALNT17
CNP10849	4	178443731	178452258	8528	0.0186	0.0000	0.0226	0.0000	
CNP10850	4	178612788	178623504	10717	0.0282	0.0000	0.0045	0.0000	
CNP10851	4	178705030	178723600	18571	0.0074	0.0000	0.0023	0.0181	
CNP10852	4	178833525	178846707	13183	0.0188	0.0000	0.0068	0.0000	
CNP731	4	179127424	179129525	2102	0.0297	0.0000			LOC285501
CNP10857	4	185223006	185226185	3180	0.0264	0.0000	0.0045	0.0203	

CNP10858	4	185397586	185404417	6832	0.0074	0.0000	0.0000	0.0158	ENPP6
CNP10863	4	188099187	188115497	16311	0.0000	0.0074	0.0000	0.0000	
CNP741	4	190432112	190436258	4147	0.3633	0.0000			
CNP744	4	191140366	191146320	5955	0.0451	0.0000	0.0181	0.0000	TUBB4Q
CNP10868	5	121675	169111	47437	0.0000	0.0186	0.0000	0.0135	
CNP10878	5	886628	928018	41391	0.0000	0.0111	0.0000	0.0090	ZDHHC11BRD9
CNP10883	5	7230342	7242924	12583	0.0111	0.0000	0.0226	0.0000	
CNP753	5	8755523	8800138	44616	0.0407	0.0000	0.0451	0.0000	
CNP10886	5	10580501	10584996	4496	0.0304	0.0000			
CNP10887	5	11181478	11184110	2633	0.0074	0.0000			CTNND2
CNP758	5	12868780	12879650	10871	0.3370	0.0000	0.6321	0.0000	
CNP761	5	14365802	14369381	3580	0.0781	0.0000			TRIO
CNP766	5	15772218	15773597	1380	0.1333	0.0000	0.2393	0.0000	FBXL7
CNP10896	5	17400702	17409239	8538	0.0150	0.0000	0.0384	0.0000	FTHL10
CNP769	5	17563468	17568801	5334	0.0259	0.0185	0.0181	0.0271	
CNP770	5	17644656	17698273	53618	0.0483	0.0000	0.0361	0.0000	
CNP10907	5	19264698	19267049	2352	0.0321	0.0000	0.0113	0.0000	
CNP10908	5	19315328	19323214	7887	0.0278	0.0000	0.0113	0.0000	
CNP10910	5	20472958	20480059	7102	0.0185	0.0000	0.0203	0.0000	
CNP10912	5	26027946	26034694	6749	0.0112	0.0000	0.0068	0.0000	
CNP778	5	27561143	27561777	635	0.0824	0.0000			
CNP779	5	28254644	28258446	3803	0.1379	0.0000	0.9639	0.0000	
CNP10915	5	29661075	29670917	9843	0.0000	0.0111	0.0203	0.0135	
CNP10917	5	32142837	32194212	51376	0.0000	0.0333	0.0000	0.0384	GOLPH3, PDZD2
CNP790	5	38180803	38184641	3839	0.1784	0.0000			
CNP10919	5	40371232	40387303	16072	0.0075	0.0000	0.0068	0.0000	
CNP10920	5	41267255	41277150	9896	0.0112	0.0000	0.0203	0.0000	C6
CNP10921	5	41607070	41617270	10201	0.0301	0.0000	0.0023	0.0000	
CNP10922	5	41623028	41630861	7834	0.0150	0.0000	0.0000	0.0000	
CNP796	5	46231640	46235192	3553	0.7640	0.0000	0.9187	0.0000	
CNP797	5	46306765	46309259	2495	0.6877	0.0000	0.7675	0.0000	
CNP10924	5	51465182	51467440	2259	0.0278	0.0000	0.0632	0.0000	
CNP799	5	52440276	52445196	4921	0.2897	0.0000			MOCS2
CNP10925	5	53725229	53729924	4696	0.0000	0.0074	0.0000	0.0068	
CNP801	5	57361784	57369290	7507	0.9852	0.0000	0.9481	0.0023	
CNP802	5	57992600	57994889	2290	0.0889	0.0000	0.0564	0.0000	RAB3C
CNP10930	5	60608904	60612617	3714	0.0074	0.0000	0.0090	0.0000	
CNP822	5	83985102	83990457	5356	0.9725	0.0000	0.9729	0.0000	
CNP825	5	86151134	86154902	3769	0.3622	0.0000			
CNP10942	5	90650176	90656821	6646	0.0157	0.0000	0.0316	0.0000	
CNP829	5	97098292	97119490	21199	0.0222	0.0000	0.0632	0.0000	

CNP830	5	97142617	97146263	3647	0.0929	0.0000	0.0700	0.0000	
CNP833	5	97512922	97517816	4895	0.0000	0.1231	0.0045	0.1783	
CNP10946	5	97961571	97963403	1833	0.0262	0.0000	0.0271	0.0023	
CNP10947	5	98117485	98123869	6385	0.0167	0.0000	0.0158	0.0000	
CNP839	5	101201120	101234788	33669	0.0296	0.0000	0.0181	0.0000	
CNP846	5	104464614	104506104	41491	0.0222	0.0000	0.0158	0.0000	
CNP10955	5	106257572	106261016	3445	0.0187	0.0000	0.0474	0.0000	
CNP10960	5	110937230	110938944	1715	0.0264	0.0000	0.0158	0.0000	
CNP10963	5	114235601	114238777	3177	0.0075	0.0000	0.0000	0.0000	
CNP10964	5	114734342	114748984	14643	0.0148	0.0000	0.0023	0.0000	
CNP850	5	114784536	114787066	2531	0.9125	0.0000			
CNP852	5	115624233	115653127	28895	0.0259	0.0000	0.0113	0.0000	COMMD10
CNP10975	5	135329914	135362750	32837	0.0074	0.0000	0.0045	0.0000	
CNP10978	5	137836323	137843610	7288	0.0259	0.0000	0.0451	0.0000	
CNP865	5	140204020	140223940	19921	0.1041	0.0000	0.1941	0.0000	PCDHA_, PCDHA14
CNP10981	5	141998202	142000197	1996	0.0112	0.0000	0.0135	0.0000	FGF1
CNP10982	5	143386880	143390529	3650	0.0902	0.0000	0.0271	0.0000	
CNP10985	5	147307539	147318106	10568	0.0000	0.0222	0.0023	0.0045	
CNP874	5	150185693	150198797	13105	0.4704	0.0000	0.2009	0.0000	
CNP876	5	151495579	151498544	2966	0.0926	0.0000	0.2844	0.0000	
CNP10989	5	152668371	152672600	4230	0.0153	0.0000	0.0090	0.0000	
CNP877	5	155409350	155415307	5958	0.1333	0.0000	0.3296	0.0000	
CNP878	5	155509796	155522862	13067	0.0519	0.0000	0.0181	0.0000	SGCD
CNP10993	5	160473766	160482276	8511	0.0111	0.0000	0.0023	0.0000	
CNP10994	5	163106031	163113414	7384	0.0113	0.0000	0.0113	0.0000	
CNP1750	5	165772240	165782533	10294	0.0632	0.0000	0.0090	0.0000	
CNP11000	5	172013141	172095539	82399	0.0000	0.0185	0.0000	0.0023	LOC391849
CNP11003	5	173633789	173635583	1795	0.0000	0.0247			
CNP11004	5	174368627	174371849	3223	0.0111	0.0000	0.0068	0.0000	
CNP11005	5	175409726	175583090	173365	0.0000	0.0185	0.0000	0.0068	LOC202134, LOC643201, LOC728334, DUF1725
CNP886	5	177090005	177131055	41051	0.0481	0.0000	0.0068	0.0000	NY-REN-7
CNP895	5	177160157	177165211	5055	0.7744	0.0000	0.7923	0.0000	
CNP11007	5	177781037	177785186	4150	0.0074	0.0000			COL23A1
CNP896	5	178042581	178045769	3189	0.8731	0.0000	0.9549	0.0000	
CNP11008	5	178662194	178863912	201719	0.0000	0.0074	0.0203	0.0023	ADAMTS2
CNP11010	5	180109948	180125790	15843	0.0000	0.0260	0.0000	0.0316	
CNP898	5	180311316	180350709	39394	0.3647	0.0000			BTNL8andBTNL3
CNP901	6	202353	326149	123797	0.4259	0.0000	0.4876	0.0000	DUSP22
CNP11017	6	4115525	4119295	3771	0.0111	0.0000	0.0000	0.0203	C6orf201
CNP11019	6	8872510	8878097	5588	0.0111	0.0000	0.0113	0.0000	
CNP11021	6	10175992	10177866	1875	0.0112	0.0000	0.0000	0.0000	

CNP11025	6	11182288	11185184	2897	0.0115	0.0000	0.0068	0.0000	
CNP11029	6	19924839	19927883	3045	0.0074	0.0000	0.0158	0.0000	
CNP11030	6	21609666	21611713	2048	0.0112	0.0000	0.0135	0.0000	
CNP902	6	26845011	26876548	31538	0.0000	0.9585	0.0000	0.9345	
CNP925	6	29945171	30029106	83936	0.4882	0.0000			P5-07, HCG2P7, P5-09,HLA-HandHLA-A, HCG4P3,HCP5P2,HCG4P6, HCP5P10, P5-05,HLA-K, HLA-16
CNP928	6	31394255	31404430	10176	0.8889	0.0000	0.9120	0.0000	HLA-B,HLA-C
CNP11042	6	31445851	31448789	2939	0.1092	0.0000	0.0429	0.0000	
CNP11043	6	31467630	31559451	91822	0.0222	0.0000	0.0068	0.0000	MICA,HCP5
CNP930	6	32539530	32681749	142220	0.8302	0.0000	0.8781	0.0000	HLA-DRB1, HLA-DRB5, HLA-DRB6
CNP933	6	32700999	32710085	9087	0.9556	0.0000	0.9526	0.0000	HLA-DQA1
CNP934	6	34046721	34050683	3963	0.6565	0.0000	0.7517	0.0000	
CNP11052	6	35613289	35672789	59501	0.0000	0.0148	0.0000	0.0113	FKBP5, LOC646819
CNP11055	6	38499784	38510599	10816	0.0112	0.0000	0.0135	0.0000	BTBD9
CNP11056	6	39176890	39180010	3121	0.0113	0.0000	0.0023	0.0000	C6orf64
CNP11060	6	44621323	44622929	1607	0.0190	0.0000			
CNP937	6	49039688	49043159	3472	0.2472	0.0000	0.2144	0.0000	
CNP11065	6	49539524	49555254	15731	0.0000	0.0259	0.0000	0.0384	CENPQ
CNP11066	6	52906021	52910202	4182	0.0148	0.0000	0.0023	0.0000	GSTA3
CNP11069	6	54956414	54958101	1688	0.0881	0.0000	0.1264	0.0000	
CNP11070	6	55934114	55951619	17506	0.0227	0.0000	0.0316	0.0000	
CNP11071	6	58534011	58535028	1018	0.0455	0.0000	0.1309	0.0000	
CNP11072	6	62983601	62986263	2663	0.0078	0.0000	0.0474	0.0000	KHDRBS2
CNP944	6	65768120	65770513	2394	0.2000	0.0000			
CNP956	6	66456258	66460573	4316	0.2388	0.0000			EGFL11
CNP958	6	67097634	67099913	2280	0.2222	0.0000	0.1174	0.0000	
CNP960	6	74648957	74658138	9182	0.3259	0.0000	0.4470	0.0000	
CNP969	6	74766429	74773741	7313	0.3926	0.0074			
CNP970	6	77073713	77084327	10615	0.0000	0.1034			
CNP973	6	77496588	77509522	12935	0.0667	0.0000	0.0181	0.0000	
CNP975	6	78938170	78955234	17065	0.2156	0.0000	0.4131	0.0000	
CNP976	6	79025784	79091904	66121	0.0967	0.0000	0.0271	0.0000	
CNP977	6	79577781	79585293	7513	0.2407	0.0000	0.4244	0.0000	
CNP978	6	81341677	81346253	4577	0.2406	0.0000			
CNP11104	6	82203843	82228325	24483	0.0074	0.0000	0.0068	0.0000	
CNP980	6	87466524	87467835	1312	0.1741	0.0000	0.0858	0.0000	
CNP984	6	93632587	93635351	2765	0.0407	0.0000	0.0090	0.0000	
CNP986	6	103844669	103868754	24086	0.1148	0.0000			
CNP11118	6	104096781	104100508	3728	0.0187	0.0000	0.0271	0.0000	
CNP11126	6	121563601	121565754	2154	0.0324	0.0000	0.0135	0.0000	C6orf170

CNP11128	6	124477644	124512064	34421	0.0000	0.0148	0.0000	0.0632	TCBA1
CNP992	6	126225385	126228469	3085	0.7296	0.0000	0.6727	0.0000	NCOA7
CNP11134	6	132751050	132754736	3687	0.0117	0.0000			MOXD1
CNP1004	6	134592448	134598896	6449	0.4684	0.0000	0.3679	0.0000	SGK
CNP11138	6	137430261	137460049	29789	0.0000	0.0185	0.0045	0.0000	
CNP11142	6	140429449	140432237	2789	0.0186	0.0000	0.0045	0.0000	LOC729070
CNP11143	6	143911563	143914293	2731	0.0111	0.0000	0.0181	0.0000	
CNP11145	6	147252374	147261510	9137	0.0111	0.0000	0.0000	0.0000	LOC729178
CNP11147	6	147480203	147486248	6046	0.0317	0.0000			LOC729178
CNP11150	6	154163677	154169933	6257	0.0074	0.0000	0.0023	0.0000	
CNP11152	6	155005358	155013624	8267	0.0236	0.0000	0.0745	0.0000	
CNP11157	6	159236414	159238562	2149	0.0195	0.0039			
CNP11162	6	162416281	162423724	7444	0.0259	0.0000	0.0045	0.0000	PARK2
CNP11164	6	162658558	162660430	1873	0.0223	0.0000	0.0045	0.0000	PARK2
CNP1010	6	165647807	165651918	4112	0.1479	0.0000			
CNP11167	6	168078125	168338764	260640	0.0000	0.0148	0.0000	0.0429	C6orf54, KIF25,MLLT4, FRMD1
CNP11168	6	168615902	168620730	4829	0.0150	0.0000	0.0135	0.0023	SMOC2
CNP11169	6	168718729	168720559	1831	0.0113	0.0000	0.0090	0.0000	SMOC2
CNP11171	6	169249708	169260860	11153	0.0185	0.0000	0.0000	0.0000	
CNP11172	7	138438	163742	25305	0.0000	0.0892	0.0000	0.0700	
CNP1031	7	250145	253709	3565	0.8127	0.0000			
CNP11176	7	3400802	3405749	4948	0.0157	0.0000	0.0068	0.0000	SDK1
CNP11178	7	3576369	3584887	8519	0.0186	0.0000	0.0293	0.0339	SDK1
CNP1040	7	4383474	4385353	1880	0.1933	0.0000	0.0609	0.0000	
CNP1042	7	6820635	6830608	9974	0.0297	0.0000	0.0135	0.0023	C7orf28B
CNP11181	7	6954353	6995310	40958	0.0075	0.0000	0.0023	0.0000	
CNP11183	7	8197116	8202432	5317	0.0075	0.0000	0.0068	0.0023	ICA1
CNP11185	7	9093698	9196410	102713	0.0074	0.0000	0.0045	0.0023	
CNP1046	7	11971497	11976296	4800	0.1294	0.2314			
CNP1051	7	13074593	13085544	10952	0.0260	0.0000	0.0135	0.0000	
CNP1053	7	15055803	15058658	2856	0.0824	0.0000	0.0158	0.0000	
CNP11196	7	16315368	16368639	53272	0.0149	0.0000	0.0023	0.0023	SOSTDC1
CNP11198	7	17060351	17062851	2501	0.0074	0.0000	0.0045	0.0203	
CNP1058	7	19145257	19147225	1969	0.0560	0.0000			
CNP11200	7	19379124	19511836	132713	0.0000	0.0074	0.0000	0.0000	
CNP11204	7	23107172	23110721	3550	0.0417	0.0038	0.0090	0.0068	
CNP11205	7	24268696	24279556	10861	0.0150	0.0000	0.0068	0.0158	
CNP1063	7	26108917	26111938	3022	0.1053	0.0000	0.0181	0.0000	
CNP11209	7	29640265	29654043	13779	0.0379	0.0038	0.0609	0.0045	Gag_p30, RVT_1, LOC646762
CNP11212	7	32697911	32703662	5752	0.0175	0.0000	0.0293	0.0474	KIAA0241
CNP11213	7	34866102	34879011	12910	0.0480	0.0000	0.0113	0.0000	NPSR1

CNP11214	7	37433093	37434593	1501	0.0076	0.0000	0.0181	0.0384	ELMO1
CNP11219	7	47251811	47255449	3639	0.0260	0.0000	0.0181	0.0023	
CNP11220	7	48363317	48371849	8533	0.0189	0.0000	0.0045	0.0271	ABCA13
CNP11221	7	48552398	48562571	10174	0.0074	0.0000	0.0474	0.0000	ABCA13
CNP11222	7	49144690	49148378	3689	0.0112	0.0000	0.0045	0.0000	
CNP11223	7	50962568	50967266	4699	0.0075	0.0000	0.0045	0.0000	
CNP11224	7	52704217	52709890	5674	0.0000	0.0152	0.0000	0.0384	
CNP11226	7	53181505	53186117	4613	0.0303	0.0000	0.0203	0.0361	
CNP11227	7	53423096	53433669	10574	0.0075	0.0000	0.0135	0.0181	
CNP11228	7	54152898	54158714	5817	0.0149	0.0000	0.0068	0.0000	
CNP1071	7	56729607	56736308	6702	0.3558	0.0000	0.3725	0.0000	
CNP11230	7	57701877	57723958	22082	0.0000	0.0112	0.0023	0.0045	
CNP11231	7	57843985	57927889	83905	0.0000	0.0112	0.0000	0.0023	
CNP1092	7	61477137	61488622	11486	0.3792	0.0000	0.3815	0.0000	
CNP11233	7	62326783	62343851	17069	0.0744	0.0124	0.0045	0.0248	PHKG1P1
CNP1095	7	64231500	64233133	1634	0.0743	0.0000	0.0226	0.0000	LOC441242
CNP1099	7	66266764	66282667	15904	0.4593	0.2358			TYW1
CNP11235	7	69835214	69840607	5394	0.0075	0.0000	0.0181	0.0181	AUTS2
CNP1102	7	70058925	70064077	5153	0.4216	0.0000	0.4131	0.0000	
CNP11236	7	71635141	71951076	315936	0.0000	0.0112	0.0000	0.0158	SBDSP, MGC87315
CNP1103	7	75192119	75202174	10056	0.7640	0.0000			HIP1
CNP1105	7	76163693	76388138	224446	0.0000	0.0560	0.0000	0.0587	POMZP3
CNP1107	7	78643235	78690629	47395	0.0075	0.0564	0.0023	0.0248	MAGI2
CNP11242	7	82553896	82555900	2005	0.0315	0.0000	0.0271	0.0000	
CNP11243	7	83620369	83624624	4256	0.0075	0.0000	0.0068	0.0429	SEMA3A
CNP1110	7	86072821	86082341	9521	0.0372	0.0000	0.0000	0.0045	Transposase
CNP11245	7	87508675	87510328	1654	0.0226	0.0000	0.0339	0.0090	ADAM22
CNP11247	7	90024002	90058767	34766	0.0000	0.0149	0.0000	0.0000	PFTK1
CNP1115	7	90869671	90878663	8993	0.0372	0.0000	0.0158	0.0000	
CNP11251	7	92831876	92835589	3714	0.0165	0.0000	0.0271	0.0384	
CNP11257	7	97090174	97096105	5932	0.0316	0.0000	0.0181	0.0090	
CNP1119	7	100167180	100170778	3599	0.1078	0.0000			ZAN
CNP1132	7	102139082	102145851	6770	0.2450	0.0000			
CNP1136	7	104252877	104259886	7010	0.0902	0.0000	0.0406	0.0000	LHFPL3, DUF1725
CNP11266	7	108383251	108424837	41587	0.0000	0.0112	0.0000	0.0000	LOC646614
CNP11270	7	110216246	110219730	3485	0.0189	0.0000	0.0068	0.0000	IMMP2L
CNP11272	7	110824661	110829589	4929	0.0239	0.0000	0.0158	0.0271	IMMP2L
CNP1139	7	110835811	110844118	8308	0.0223	0.0000	0.0023	0.0000	IMMP2L
CNP11275	7	112301356	112305297	3942	0.0504	0.0000	0.0023	0.0000	FLJ31818
CNP11277	7	115370689	115373669	2981	0.0228	0.0000	0.0113	0.0226	TFEC
CNP11278	7	117922977	117948608	25632	0.0150	0.0000	0.0090	0.0203	

CNP11279	7	118479931	118481573	1643	0.0285	0.0000	0.0135	0.0000	
CNP1145	7	118944214	118949683	5470	0.0297	0.0000	0.0248	0.0000	
CNP11283	7	120949223	120973529	24307	0.0114	0.0000	0.0158	0.0000	
CNP11288	7	125259938	125263279	3342	0.0158	0.0000	0.0203	0.0000	
CNP1154	7	125832718	125833851	1134	0.0558	0.0000	0.0090	0.0000	
CNP11290	7	131428987	131430799	1813	0.0112	0.0000	0.0293	0.0000	
CNP1159	7	133435735	133449694	13960	0.8172	0.0000	0.7652	0.0000	
CNP11298	7	139650512	139654935	4424	0.0075	0.0000	0.0226	0.0000	
CNP11299	7	139839330	139845481	6152	0.0305	0.0000	0.0135	0.0000	
CNP1162	7	141416112	141438377	22266	0.4349	0.0000	0.5305	0.0000	Glyco_hydro_31, MGAM
CNP1174	7	141693868	141712586	18719	0.1933	0.0000	0.3296	0.0000	TRBV4-3, V-set, TRB_
CNP1175	7	141891589	141902884	11296	0.8253	0.0000	0.6569	0.0000	TRBV7-8, TRB_
CNP11309	7	141969866	142005164	35299	0.0112	0.0000	0.0023	0.0000	TRBV14, TRBV15, TRBV12-5, TRBV18
CNP1177	7	142155609	142167486	11878	0.0301	0.0000	0.0361	0.0000	TRY6, TRB_
CNP1179	7	142929090	143198992	269903	0.5985	0.0000	0.6366	0.0000	KIAA0738, LOC728314, LOC653199, LOC441294, FLJ40722, CTAGE6
CNP1180	7	143341029	143342084	1056	0.0000	0.9962			
CNP11320	7	145764800	145770841	6042	0.0476	0.0040	0.0203	0.0113	CNTNAP2
CNP11326	7	149425988	149435586	9599	0.0342	0.0043	0.0361	0.0248	
CNP1183	7	149916734	149932502	15769	0.7119	0.0000			
CNP11328	7	150196889	150203370	6482	0.0112	0.0000	0.0090	0.0000	TMEM176B
CNP11330	7	152780054	152825299	45246	0.0074	0.0037	0.0000	0.0000	
CNP11331	7	153130910	153299551	168642	0.0000	0.0223	0.0000	0.0023	LOC653748
CNP1191	7	154024104	154031766	7663	0.3534	0.0000			
CNP11333	7	154515932	154520474	4543	0.0186	0.0000	0.0226	0.0000	
CNP11336	7	155991370	156003709	12340	0.0149	0.0000	0.0023	0.0000	C7orf13
CNP1196	7	156084551	156086940	2390	0.6318	0.0000	0.7043	0.0000	C7orf13
CNP1202	7	157031128	157043601	12474	0.1264	0.0000	0.1919	0.0000	PTPRN2
CNP1203	7	157810312	157824926	14615	0.5560	0.0000			PTPRN2
CNP11339	7	158810402	158812015	1614	0.0157	0.0000	0.0519	0.0339	
CNP1204	8	1346118	1348109	1992	0.9926	0.0000	0.9729	0.0000	
CNP1207	8	2067801	2069206	1406	0.1723	0.0000	0.0655	0.0000	MYOM2
CNP11345	8	2116952	2120782	3831	0.0543	0.0000	0.0361	0.0000	
CNP1210	8	2140221	2145353	5133	0.3160	0.0000			
CNP1214	8	2242045	2246765	4721	0.0297	0.0000	0.0271	0.0000	
CNP1216	8	3774469	3777514	3046	0.1294	0.7255			CSMD1
CNP1222	8	3989600	3991699	2100	0.0743	0.0112	0.1061	0.0000	CSMD1
CNP11358	8	4013916	4019232	5317	0.0112	0.0074	0.0113	0.0203	CSMD1
CNP11361	8	4598305	4697836	99532	0.0074	0.0111	0.0000	0.0023	CSMD1
CNP11362	8	4706329	4742189	35861	0.0148	0.0111	0.0045	0.0000	CSMD1
CNP1224	8	5586134	5591731	5598	0.0372	0.0074	0.0045	0.0203	

CNP11370	8	5841704	5938256	96553	0.0000	0.0074	0.0045	0.0000	
CNP11371	8	6050901	6056171	5271	0.0111	0.0000	0.0000	0.0000	
CNP11372	8	6109951	6111529	1579	0.0226	0.0000	0.0203	0.0000	
CNP11373	8	6165713	6187827	22115	0.0111	0.0000	0.0000	0.0000	
CNP1236	8	7237790	7836261	598472	0.0929	0.0074	0.1242	0.0045	LOC728753, DEFB106A, DEFB104B, LOC728731, DEFB104A, FAM90A8, FAM90A9, DEFB106B, DEFB108P1, SPAG11B, SPAG11A, DEFB4, LOC728746, LOC441326, DEFB107B, LOC729372, DEFB107A, DEFB103A, LOC441323, DEFB105B, DEFB105A, LOC645808, LOC728454, FAM90A7, LOC729371,FAM90A10
CNP1244	8	7891705	7903572	11868	0.0000	0.9673			Defensin
CNP11393	8	8324455	8328763	4309	0.0187	0.0000	0.0587	0.0000	
CNP11395	8	9093876	9099936	6061	0.0222	0.0000	0.0181	0.0000	
CNP1245	8	12025135	12039385	14251	0.0409	0.0000	0.0045	0.0000	LOC728957
CNP1252	8	12260380	12286526	26147	0.2900	0.3117			ZNF705C
CNP11412	8	12593598	12597159	3562	0.0422	0.0000	0.0181	0.0000	
CNP1253	8	12693099	12696897	3799	0.2582	0.2770			
CNP1257	8	13643472	13644762	1291	0.2992	0.0000	0.4921	0.0000	
CNP1258	8	13659088	13696077	36990	0.0407	0.0000	0.0203	0.0000	
CNP11419	8	13720460	13740957	20498	0.0111	0.0000	0.0068	0.0000	
CNP1260	8	13854600	13859608	5009	0.1148	0.0000	0.0068	0.0000	
CNP11421	8	14553275	14559579	6305	0.0149	0.0000	0.0090	0.0000	SGCZ
CNP11424	8	14832796	14840174	7379	0.0149	0.0000	0.0090	0.0000	SGCZ
CNP1261	8	15447431	15455977	8547	0.3185	0.0000	0.0880	0.0000	TUSC3
CNP1269	8	16251325	16251494	170	0.0519	0.0000	0.0451	0.0000	MSR1
CNP1271	8	16306635	16319032	12398	0.3678	0.0000			MSR1
CNP11429	8	16367417	16371014	3598	0.0313	0.0000	0.0090	0.0000	MSR1
CNP11435	8	18895819	18903101	7283	0.0148	0.0000	0.0203	0.0000	PSD3
CNP11441	8	21374732	21379526	4795	0.0153	0.0000	0.0068	0.0000	
CNP1272	8	24201375	24207011	5637	0.0926	0.0000	0.0971	0.0000	
CNP1282	8	25030439	25040250	9812	0.2119	0.0000	0.0519	0.0000	
CNP11446	8	26935440	26942727	7288	0.0152	0.0000	0.0790	0.0000	
CNP1284	8	32802640	32807955	5316	0.3755	0.0000	0.5169	0.0000	
CNP11449	8	36194697	36197883	3187	0.0385	0.0000	0.0655	0.0000	
CNP11450	8	37509143	37514234	5092	0.0317	0.0000	0.0226	0.0000	
CNP1291	8	39354760	39506122	151363	0.9815	0.0000	0.9797	0.0000	ADAM3A, TMDCII
CNP1293	8	40302954	40308668	5715	0.3667	0.0000	0.6208	0.0000	
CNP1294	8	47646713	47655709	8997	0.0556	0.0000	0.1129	0.0000	LOC389652
CNP1299	8	50622571	50695376	72806	0.0000	0.0940	0.0045	0.1693	
CNP1302	8	51194577	51195974	1398	0.0000	0.0111	0.0000	0.0000	SNTG1
CNP11463	8	54122300	54154739	32440	0.0185	0.0000	0.0000	0.0000	

CNP1303	8	55371599	55373373	1775	0.2602	0.0000			
CNP11468	8	57212475	57256905	44431	0.0000	0.0074	0.0000	0.0135	PLAG1
CNP1308	8	58279104	58292579	13476	0.0852	0.0000	0.0248	0.0000	
CNP11469	8	58520879	58529512	8634	0.0340	0.0000	0.0248	0.0000	
CNP1311	8	61165356	61170323	4968	0.3608	0.0000	0.0316	0.0000	
CNP1313	8	63380105	63386639	6535	0.0185	0.0000	0.0090	0.0000	FAM77D
CNP11474	8	65409538	65420057	10520	0.0148	0.0000	0.0203	0.0000	
CNP1316	8	68710013	68712760	2748	0.1037	0.0000	0.0384	0.0000	CPA6
CNP1320	8	72377865	72379153	1289	0.0556	0.0000	0.0023	0.0000	EYA1
CNP1324	8	75481738	75490149	8412	0.2333	0.0000	0.4424	0.0000	
CNP11482	8	79341169	79347883	6715	0.0153	0.0000	0.0293	0.0000	
CNP1326	8	85425438	85431221	5784	0.1037	0.0000	0.0542	0.0000	LOC138046
CNP11487	8	86726773	86744665	17893	0.0000	0.0112	0.0023	0.0023	LOC392242
CNP11490	8	89997494	89999111	1618	0.0394	0.0000	0.0068	0.0000	
CNP11495	8	96923541	96926233	2693	0.0149	0.0000	0.0135	0.0000	
CNP11497	8	102057367	102061693	4327	0.0192	0.0000	0.0113	0.0000	
CNP1329	8	102689782	102694888	5107	0.0778	0.0000	0.0632	0.0000	GRHL2
CNP11501	8	107927695	107931446	3752	0.0347	0.0000	0.0293	0.0000	
CNP11504	8	112057232	112059278	2047	0.0089	0.0000			
CNP1339	8	112363455	112364436	982	0.0852	0.0000	0.0135	0.0000	
CNP11506	8	115222742	115279466	56725	0.0075	0.0000	0.0158	0.0000	
CNP1343	8	115703663	115710907	7245	0.5431	0.0000	0.8533	0.0000	
CNP11510	8	117699864	117702442	2579	0.0185	0.0000	0.0113	0.0000	
CNP1346	8	120223965	120228627	4663	0.2852	0.0000	0.2460	0.0000	
CNP11511	8	122390260	122408901	18642	0.0000	0.0111	0.0045	0.0113	
CNP11512	8	122474363	122496536	22174	0.0000	0.0112	0.0000	0.0000	
CNP11516	8	127346504	127348627	2124	0.0075	0.0000			
CNP1350	8	130211860	130213708	1849	0.2910	0.0000	0.3228	0.0000	
CNP11521	8	133060271	133063758	3488	0.0553	0.0000	0.0293	0.0000	KIAA0143
CNP1359	8	135130437	135135890	5454	0.1115	0.0000	0.0497	0.0000	
CNP11524	8	136692574	136694147	1574	0.0152	0.0000	0.0135	0.0000	KHDRBS3
CNP1364	8	137836926	137925499	88574	0.0630	0.0000	0.0068	0.0000	
CNP11529	8	140673518	140675508	1991	0.0000	0.0565	0.0000	0.0835	
CNP11530	8	142926302	142931358	5057	0.0112	0.0000	0.0135	0.0023	
CNP1367	8	144776300	144778949	2650	0.0222	0.0000	0.0474	0.0000	
CNP11533	9	139481	264606	125126	0.0000	0.0075	0.0000	0.0023	CBWD1, LOC642313, C9orf66, DOCK8
CNP1377	9	508099	516993	8895	0.5188	0.0000			ANKRD15
CNP1378	9	581969	592903	10935	0.0410	0.0000	0.0068	0.0000	ANKRD15
CNP11538	9	2138837	2140663	1827	0.0192	0.0000	0.0677	0.0181	SMARCA2
CNP1380	9	4518770	4519873	1104	0.0299	0.0000	0.0023	0.0000	SLC1A1
CNP11545	9	5301567	5327707	26141	0.0150	0.0000	0.0113	0.0000	RLN1

CNP11546	9	5375779	5388011	12233	0.0075	0.0000	0.0045	0.0045	C9orf46
CNP11549	9	6662095	6663766	1672	0.0150	0.0000	0.0090	0.0000	
CNP11553	9	8605659	8610138	4480	0.0118	0.0000			PTPRD
CNP11556	9	10531175	10573273	42099	0.0075	0.0000	0.0023	0.0045	
CNP11562	9	11931913	11942799	10887	0.0224	0.0000	0.0068	0.0000	
CNP1395	9	11957036	11965492	8457	0.0187	0.0000	0.0068	0.0023	
CNP11565	9	16061336	16064727	3392	0.0075	0.0037	0.0361	0.0158	
CNP11571	9	20791650	20794674	3025	0.0189	0.0000	0.0023	0.0113	KIAA1797
CNP1404	9	23353115	23363484	10370	0.0225	0.0000	0.9526	0.0000	
CNP11577	9	24487680	24498238	10559	0.0338	0.0000	0.1061	0.0000	
CNP11579	9	26557699	26562239	4541	0.0075	0.0000	0.0090	0.0045	
CNP11580	9	26703320	26708477	5158	0.0075	0.0000	0.0248	0.0000	
CNP1416	9	28037588	28040691	3104	0.5393	0.0000	0.5914	0.0000	LINGO2
CNP11583	9	28454272	28463650	9379	0.0000	0.0075	0.0000	0.0181	LINGO2
CNP1418	9	29084549	29087680	3132	0.0746	0.0000	0.0497	0.0000	
CNP11589	9	32706572	32717150	10579	0.0000	0.0075	0.0000	0.0023	
CNP11591	9	37494703	37504032	9330	0.0000	0.0224	0.0000	0.0045	C9orf105,FBXO10, POLR1E
CNP11592	9	38476211	38488481	12271	0.0350	0.0000	0.0158	0.0000	
CNP11594	9	38906782	39964796	1058015	0.0075	0.0075	0.0068	0.0023	FAM74A1, PTPS, LOC727745,LOC653809, FAM75A2, CNTNAP3, C9orf36,LOC653501
CNP11597	9	41590614	41599775	9162	0.0122	0.0244	0.0226	0.0361	ZNF658B
CNP1419	9	41962506	41975187	12682	0.5145	0.0000			KGFLP2
CNP1432	9	43255666	43735571	479906	0.6387	0.0798			LOC728577, LOC442416,FAM75A6
CNP1434	9	44183430	44213237	29808	0.4053	0.0000			LOC728195
CNP1435	9	44667855	44795733	127879	0.0000	0.6809			
CNP11612	9	45240199	45506515	266317	0.0082	0.0206	0.0587	0.0203	LOC441420, LOC653305, LOC643395, LOC643416,
CNP11614	9	66324679	66501564	176886	0.0042	0.0375	0.0226	0.0023	DUF1725
CNP1447	9	67675871	67678367	2497	0.0000	0.0075	0.0203	0.0000	
CNP1452	9	68073667	68115167	41501	0.7218	0.0000			DUF1725
CNP1453	9	68143441	68227664	84224	0.0000	0.0037	0.0000	0.0000	
CNP1456	9	68795766	68812645	16880	0.0193	0.0965	0.0113	0.0203	
CNP1461	9	68890045	68905448	15404	0.1770	0.5072			
CNP1462	9	69114786	69131209	16424	0.0000	0.0302			V-set, LOC644653
CNP1436	9	69168902	69213466	44565	0.4549	0.0000	0.6817	0.0023	V-set, Ank
CNP1463	9	71225013	71238848	13836	0.0000	0.0158	0.9797	0.0000	APBA1
CNP11623	9	71288388	71309940	21553	0.0112	0.0149	0.0045	0.0068	APBA1
CNP11625	9	72692075	72697041	4967	0.0112	0.0000	0.0000	0.0226	TRPM3
CNP1468	9	73446556	73448642	2087	0.0000	0.0376	0.0000	0.0113	
CNP11628	9	75210678	75216486	5809	0.0169	0.0000	0.0429	0.0000	
CNP11629	9	75257832	75268983	11152	0.0113	0.0000	0.0045	0.0135	
CNP11631	9	78312168	78315130	2963	0.0152	0.0000	0.0000	0.0609	GCNT1

CNP1475	9	78746701	78749156	2456	0.0485	0.0000	0.0045	0.0045		
CNP11632	9	78960326	78967224	6899	0.0000	0.0262	0.0113	0.0429		
CNP11633	9	80628360	80658853	30494	0.0150	0.0000	0.0023	0.0000		
CNP11635	9	82172211	82174215	2005	0.0546	0.0000	0.0248	0.0000		
CNP11636	9	84566389	84574064	7676	0.0037	0.0075	0.0271	0.0226		
CNP1478	9	85704275	85707363	3089	0.2489	0.0000	0.3725	0.0023	KIF27	
CNP11640	9	93442089	93443262	1174	0.0112	0.0000	0.0248	0.0000	ROR2	
CNP1483	9	98700200	98729161	28962	0.0000	0.1212	0.0000	0.0226	HIATL2, LOC441454	
CNP11645	9	105010731	105023627	12897	0.0000	0.0187	0.0000	0.0023		
CNP1491	9	106403809	106406604	2796	0.1013	0.0000				
CNP1495	9	112064610	112067990	3381	0.0749	0.0000	0.0181	0.0000		
CNP11653	9	113064716	113071390	6675	0.0113	0.0000	0.0158	0.0000		
CNP11654	9	114423076	114630399	207324	0.0000	0.0149	0.0000	0.0068	KIAA1958,C9orf80, SNX30	
CNP11655	9	114894172	114923574	29403	0.0037	0.0075	0.0023	0.0045		
CNP1502	9	127984106	127994130	10025	0.4179	0.0000	0.3567	0.0000		
CNP1512	9	128015136	128016523	1388	0.0974	0.0000				
CNP1513	9	133250747	133255525	4779	0.0709	0.0000	0.0203	0.0000		
CNP11660	9	134933035	134947261	14227	0.0000	0.0547	0.0000	0.0474	CEL	
CNP11661	9	135118363	135122692	4330	0.0192	0.0000			ABO	
CNP1522	9	137353926	137356233	2308	0.1236	0.0000	0.1309	0.0000		
CNP11663	9	140145139	140152969	7831	0.0232	0.0039	0.0790	0.0113		
CNP1529	9	140191761	140195375	3615	0.7137	0.0000	0.5824	0.0000		
CNP11664	10	123551	133255	9705	0.0112	0.0000	0.0135	0.0000		
CNP11665	10	1853064	1909687	56624	0.0000	0.0074	0.0000	0.0000		
CNP11670	10	5705468	5757133	51666	0.0000	0.0185	0.0000	0.0000	ASB13	
CNP11673	10	6697781	6704159	6379	0.0149	0.0000	0.0203	0.0000		
CNP1534	10	13096556	13098846	2291	0.0000	0.3786			CCDC3	
CNP1548	10	20890118	20893540	3423	0.0333	0.0000	0.0361	0.0000		
CNP11689	10	24201315	24206054	4740	0.0000	0.0149			KIAA1217	
CNP1558	10	24417680	24419045	1366	0.2639	0.0000	0.3499	0.0000	KIAA1217	
CNP11695	10	26726161	26729771	3611	0.0586	0.0000	0.0226	0.0000		
CNP11697	10	27265911	27268479	2569	0.0078	0.0471			C10orf51	
CNP11698	10	28604766	28609676	4911	0.0149	0.0000			MPP7	
CNP11703	10	32290286	32306951	16666	0.0000	0.0074	0.0023	0.0000		
CNP11704	10	34557071	34562360	5290	0.0186	0.0000	0.0000	0.0000	PARD3	
CNP11708	10	45392881	45396237	3357	0.0656	0.0000	0.0632	0.0000		8-Mar
CNP1562	10	47012100	47165567	153468	0.3244	0.0000			ANTXRL,LOC728691, LOC728684	
CNP11715	10	48212212	48214020	1809	0.0311	0.0000	0.0045	0.0023	LOC644021	
CNP11719	10	50674142	50680904	6763	0.0519	0.0000	0.1738	0.0000		
CNP11720	10	50783051	50800899	17849	0.0000	0.0152			LOC727726	
CNP11721	10	52061462	52063834	2373	0.0394	0.0000	0.0361	0.0000		

CNP1586	10	54599860	54609155	9296	0.0372	0.0558	0.0135	0.0813	
CNP11726	10	54789051	54812107	23057	0.0111	0.0000	0.0023	0.0000	
CNP1599	10	56122955	56138443	15489	0.0296	0.0000	0.0181	0.0000	PCDH15
CNP1601	10	56353096	56362605	9510	0.0000	0.0373	0.0000	0.0429	
CNP11734	10	56849158	56852828	3671	0.0111	0.0000	0.0090	0.0000	
CNP1602	10	58186381	58196843	10463	0.2687	0.0000	0.5282	0.0000	
CNP11736	10	58410019	58421992	11974	0.0000	0.0112	0.0000	0.0135	
CNP11737	10	58516320	58519894	3575	0.0456	0.0000	0.0203	0.0000	
CNP1605	10	58572176	58606913	34738	0.0889	0.0000			
CNP1607	10	58880511	58880997	487	0.0370	0.0000	0.0000	0.0000	
CNP1610	10	61034136	61035270	1135	0.2575	0.0000			
CNP11746	10	66105900	66109037	3138	0.0149	0.0000	0.0090	0.0000	
CNP1614	10	66977929	66984452	6524	0.1815	0.0000	0.1761	0.0000	
CNP1620	10	67013460	67013961	502	0.4000	0.0000	0.4041	0.0000	
CNP11755	10	67944731	67948321	3591	0.0113	0.0000	0.0135	0.0000	CTNNA3
CNP11757	10	70282650	70292123	9474	0.0185	0.0000	0.0045	0.0000	STOX1
CNP11763	10	73532154	73535907	3754	0.0114	0.0000	0.0023	0.0000	ASCC1
CNP1621	10	77927067	77930591	3525	0.1041	0.0000	0.0248	0.0000	C10orf11
CNP1627	10	81053880	81055405	1526	0.6858	0.0000			
CNP1629	10	81475459	81486935	11477	0.4921	0.0000			DUF1725
CNP11767	10	81552167	81587759	35593	0.0379	0.0265	0.0293	0.0226	LOC642361,DUF1725
CNP11770	10	82871310	82879763	8454	0.0149	0.0000	0.0564	0.0000	
CNP11771	10	83874641	83878647	4007	0.0076	0.0000	0.0293	0.0000	NRG3
CNP11772	10	84400707	84421820	21114	0.0000	0.0074	0.0000	0.0068	NRG3
CNP11773	10	84702878	84707152	4275	0.0397	0.0040	0.0158	0.0361	NRG3
CNP11775	10	86728739	86737527	8789	0.0116	0.0000	0.2122	0.0023	
CNP11777	10	87791026	87798355	7330	0.0074	0.0000	0.0023	0.0000	GRID1
CNP1631	10	89060724	89084996	24273	0.6111	0.0000	0.5576	0.0000	LOC728190
CNP11780	10	90932947	90938070	5124	0.0449	0.0000	0.0971	0.0000	
CNP11781	10	91988396	91992471	4076	0.0781	0.0000	0.0271	0.0000	
CNP11783	10	92915179	92923075	7897	0.0111	0.0000	0.0000	0.0000	PCGF5
CNP11784	10	94153462	94160827	7366	0.0237	0.0000	0.0248	0.0000	
CNP11786	10	99824936	99827390	2455	0.0074	0.0000	0.0000	0.0000	
CNP11788	10	102345103	102352103	7001	0.0150	0.0000	0.0384	0.0000	
CNP1636	10	107047028	107049160	2133	0.0837	0.0494			
CNP1648	10	114102065	114106829	4765	0.3444	0.0000	0.2393	0.0000	
CNP11795	10	122760653	122766583	5931	0.0466	0.0000	0.0226	0.0000	
CNP1655	10	124331524	124341001	9478	0.0000	0.8178			DMBT1
CNP11800	10	126060139	126064222	4084	0.0113	0.0000	0.0068	0.0000	
CNP11804	10	132208544	132210099	1556	0.0391	0.0000	0.0068	0.0000	
CNP11807	10	133497123	133508705	11583	0.0259	0.0000	0.0113	0.0000	

CNP1662	10	135092867	135146259	53393	0.1992	0.2184			LOC619207
CNP1669	10	135178653	135227268	48616	0.0000	0.0370	0.0000	0.0293	SYCE1, CYP2E1, LOC619207
CNP11813	10	135250509	135356694	106186	0.0000	0.0407	0.0000	0.0068	LOC441581
CNP1670	11	4206589	4293105	86517	0.0000	0.0784	0.0000	0.0339	
CNP11816	11	4466713	4518969	52257	0.0074	0.0000	0.0000	0.0000	OR52K1
CNP1674	11	4924689	4933658	8970	0.1504	0.0714			OR51A2, MMP26, OR51A4
CNP11821	11	5228251	5230232	1982	0.0000	0.0150	0.0113	0.0135	HBG2,HBG1
CNP1675	11	5478747	5480169	1423	0.5821	0.0821	0.6704	0.0113	HBG2,HBG1
CNP1678	11	5744656	5765715	21060	0.1190	0.0000	0.1874	0.0023	TRIM5, OR52N5, OR52N1
CNP1679	11	5828813	5839893	11081	0.3333	0.0000	0.4334	0.0000	TRIM5, OR52E8
CNP11826	11	5842285	5892086	49802	0.0000	0.0296	0.0023	0.0000	TRIM5, OR52E4
CNP1680	11	7769616	7798159	28544	0.1429	0.0000	0.0429	0.0000	OR5P2
CNP11828	11	9391796	9397985	6190	0.0122	0.0000	0.0045	0.0000	IPO7
CNP11831	11	10922331	10938872	16542	0.0000	0.0185	0.0023	0.0181	
CNP11833	11	11258385	11262056	3672	0.0111	0.0000	0.0068	0.0000	GALNTL4
CNP1682	11	18905648	18918564	12917	0.2667	0.0000	0.0677	0.0000	LOC729352, MRGPRX1
CNP1690	11	21149965	21166513	16549	0.0451	0.4248			NELL1
CNP1693	11	21671128	21679716	8589	0.0296	0.0000	0.0068	0.0000	
CNP1695	11	24400825	24406833	6009	0.0933	0.0000			
CNP11849	11	25040789	25042313	1525	0.0192	0.0000	0.0474	0.0000	LUZP2
CNP11850	11	25090419	25250126	159708	0.0111	0.0000	0.0068	0.0000	
CNP11851	11	25384338	25390482	6145	0.0152	0.0000	0.0135	0.0000	
CNP1700	11	25565122	25584722	19601	0.0296	0.0000	0.0880	0.0000	LOC554234
CNP1702	11	25663542	25675557	12016	0.0296	0.0000	0.0248	0.0000	
CNP1704	11	30129311	30137019	7709	0.0556	0.0000	0.0135	0.0000	
CNP11858	11	34177080	34179952	2873	0.0111	0.0000	0.0023	0.0000	ABTB2
CNP11862	11	38414524	38419763	5240	0.0185	0.0000	0.0045	0.0000	
CNP11863	11	41295844	41303860	8017	0.0000	0.0149	0.0023	0.0090	
CNP1707	11	42769727	42774615	4889	0.0296	0.0000	0.0113	0.0000	
CNP11864	11	42926159	42927743	1585	0.0000	0.0488	0.0000	0.9797	
CNP11866	11	48729238	48740069	10832	0.0150	0.0000	0.0135	0.0203	
CNP1719	11	48843099	48849795	6697	0.3043	0.0000			
CNP1723	11	49044557	49060262	15706	0.0074	0.0520	0.0090	0.0248	
CNP11869	11	49264380	49317267	52888	0.0112	0.0000	0.0023	0.0000	
CNP1724	11	49667437	49714078	46642	0.0407	0.0000	0.0045	0.0000	LOC440040
CNP1725	11	49716131	49717264	1134	0.1074	0.0000	0.0745	0.0000	LOC440040
CNP1726	11	51209566	51213821	4256	0.1407	0.0000	0.1625	0.0000	
CNP1729	11	54458221	54514519	56299	0.6206	0.0000	0.7269	0.0000	
CNP1730	11	54722184	54793048	70865	0.8387	0.0000	0.8849	0.0000	TRIM48
CNP1731	11	55130608	55209585	78978	0.2500	0.0000	0.2506	0.0000	OR4S2, OR4C6, OR4P4
CNP1732	11	55217259	55303668	86410	0.4407	0.0000	0.3995	0.0000	OR5D13

CNP11880	11	57401386	57405822	4437	0.0076	0.0038	0.0000	0.0564	
CNP11881	11	57608407	57612191	3785	0.0210	0.0000	0.0023	0.0000	OR9Q1
CNP1733	11	58567820	58610341	42522	0.0259	0.0000	0.0203	0.0000	LOC643637
CNP11884	11	59371967	59382587	10621	0.0074	0.0000	0.0000	0.0023	TCN1
CNP1739	11	67396131	67419050	22920	0.0000	0.1444	0.0023	0.0339	
CNP1744	11	75820665	75825933	5269	0.0407	0.0000	0.0045	0.0000	
CNP1754	11	79650579	79659825	9247	0.0259	0.0000	0.0135	0.0000	
CNP11899	11	80550138	80556840	6703	0.0074	0.0000	0.0068	0.0000	
CNP11900	11	80575854	80583265	7412	0.0000	0.0149	0.0000	0.0090	
CNP11904	11	81189919	81194913	4995	0.1331	0.0000	0.1625	0.0000	
CNP1760	11	85567306	85576469	9164	0.0296	0.0000	0.0587	0.0000	
CNP1765	11	90207835	90210585	2751	0.2007	0.0000	0.0429	0.0000	
CNP11907	11	90545908	90552634	6727	0.0187	0.0000	0.0158	0.0000	
CNP11911	11	92344805	92346836	2032	0.0000	0.0148	0.0000	0.0113	MTNR1B
CNP11914	11	93337704	93341240	3537	0.1429	0.0000	0.0271	0.0000	
CNP1777	11	104429072	104436443	7372	0.0704	0.0000	0.0158	0.0000	
CNP11919	11	104455634	104477768	22135	0.0000	0.0148	0.0000	0.0000	INCA
CNP11920	11	104555015	104572108	17094	0.0149	0.0000	0.0000	0.0000	INCA
CNP11925	11	106843163	106852442	9280	0.0111	0.0000	0.0068	0.0000	
CNP11926	11	107158953	107176398	17446	0.0000	0.0111	0.0000	0.0519	SLC35F2
CNP1782	11	107289717	107292923	3207	0.3182	0.0000			SLC35F2
CNP11931	11	123592514	123601125	8612	0.0000	0.0112	0.0000	0.0090	OR8G2, marore
CNP11933	11	127838729	127840260	1532	0.0595	0.0000	0.0203	0.0000	ETS1
CNP11936	11	134085524	134108160	22637	0.0000	0.0185	0.0000	0.0203	
CNP11937	11	134119190	134132093	12904	0.0000	0.0185	0.0000	0.0135	LOC729305
CNP11938	12	248989	255352	6364	0.0074	0.0000	0.0000	0.0203	SLC6A13
CNP11939	12	303069	414108	111040	0.0000	0.0074	0.0000	0.0045	CCDC77,B4GALNT3, JARID1A
CNP1796	12	739370	744290	4921	0.0967	0.0074	0.2438	0.0000	WNK1
CNP1799	12	2116123	2128667	12545	0.0595	0.0000	0.0903	0.0090	CACNA1C
CNP11946	12	4213627	4218670	5044	0.0075	0.0000	0.0023	0.0045	
CNP11948	12	6407756	6453667	45912	0.0000	0.0075	0.0000	0.0113	CD27,TAPBPL, SRP14P1, VAMP1
CNP11949	12	7895692	8015167	119476	0.0000	0.0446	0.0000	0.0293	NANOGP1, SLC2A3, SLC2A14
CNP1809	12	8449755	8475939	26185	0.9663	0.0000	0.9774	0.0000	
CNP11951	12	8902508	8905023	2516	0.0075	0.0000	0.0497	0.0000	A2ML1
CNP1811	12	9524645	9619559	94915	0.7286	0.0000	0.8104	0.0000	LOC728735, A2M, A2M_N_2
CNP11953	12	9753345	9766191	12847	0.0074	0.0000	0.0181	0.0135	DCAL1
CNP1812	12	10474634	10487386	12753	0.2846	0.0000	0.4199	0.0000	KLRC2,KLRC3
CNP1813	12	11113633	11132799	19167	0.6022	0.0000	0.7336	0.0000	TAS2R14,PRH1,PRR4, TAS2R64P
CNP1814	12	11403759	11434653	30895	0.1610	0.1423			
CNP1815	12	12428764	12433138	4375	0.0409	0.0000	0.1242	0.0000	LOH12CR1
CNP11960	12	15459186	15464906	5721	0.0451	0.0000	0.0068	0.0090	PTPRO

CNP11961	12	17481711	17491817	10107	0.0152	0.0000	0.0158	0.0181	
CNP11963	12	17853447	17856104	2658	0.0000	0.0150	0.0000	0.0406	
CNP1827	12	27539008	27542629	3622	0.0892	0.0000	0.0609	0.0000	LOC341346
CNP1828	12	27986760	27988911	2152	0.1710	0.0000	0.0767	0.0000	
CNP11973	12	28656614	28658887	2274	0.0075	0.0000	0.0045	0.0384	
CNP1832	12	30128768	30135200	6433	0.1970	0.0000	0.1738	0.0000	
CNP1834	12	31264657	31293961	29305	0.0000	0.0448	0.0045	0.0813	OVOS2
CNP11977	12	31791817	31801173	9357	0.0075	0.0000	0.0158	0.0113	LOC144383
CNP11980	12	31944499	31949242	4744	0.0315	0.0118	0.0384	0.0339	
CNP1836	12	33192673	33198641	5969	0.1747	0.0000	0.3386	0.0000	
CNP1837	12	33270866	33286685	15820	0.6952	0.0000	0.3093	0.0000	
CNP11983	12	33614743	33623007	8265	0.0112	0.0037	0.0090	0.0113	
CNP1841	12	34099623	34107572	7950	0.1716	0.0000	0.0181	0.0000	
CNP11986	12	34147976	34153819	5844	0.0156	0.0000	0.0587	0.0293	
CNP11987	12	34206228	34694313	488086	0.0000	0.0112	0.0000	0.0158	
CNP11988	12	36340414	36394320	53907	0.0300	0.0037	0.0113	0.0384	
CNP11990	12	36565610	36578346	12737	0.0169	0.0042	0.0113	0.0226	
CNP11991	12	36947182	36955164	7983	0.0117	0.0039	0.0023	0.0181	
CNP11992	12	38589773	38601293	11521	0.0112	0.0000	0.0068	0.0135	SLC2A13
CNP1846	12	39103864	39107744	3881	0.0335	0.0000	0.0181	0.0000	VWD
CNP1849	12	44192107	44195804	3698	0.5000	0.0000			
CNP12001	12	60488837	60497087	8251	0.0347	0.0000	0.0271	0.0090	FAM19A2
CNP12002	12	62225991	62406909	180919	0.0000	0.0074	0.0000	0.0090	DPY19L2, LOC390338
CNP12003	12	62687505	62691702	4198	0.0076	0.0000	0.0000	0.0113	SRGAP1
CNP12004	12	65249567	65257291	7725	0.0074	0.0000	0.0023	0.0113	PDZ
CNP12007	12	68797034	68805714	8681	0.0000	0.0114	0.0000	0.0158	
CNP1861	12	69158942	69164294	5353	0.2751	0.0000			
CNP12010	12	69785308	69796518	11211	0.0000	0.0297	0.0000	0.0045	
CNP12011	12	72277693	72283646	5954	0.0074	0.0000	0.0090	0.0181	
CNP12014	12	79349306	79352242	2937	0.0156	0.0000	0.0203	0.0564	
CNP1868	12	81766030	81767904	1875	0.0149	0.0000	0.0000	0.0158	TMTC2
CNP1872	12	82687421	82689372	1952	0.4556	0.0000			
CNP12017	12	83237406	83241893	4488	0.0076	0.0000	0.0023	0.0113	
CNP1874	12	85225213	85236932	11720	0.1375	0.0000	0.0384	0.0000	MGAT4C
CNP12018	12	85937514	85950402	12889	0.0113	0.0000	0.0045	0.0226	
CNP1875	12	86055044	86057392	2349	0.0706	0.0000	0.0158	0.0000	
CNP1877	12	89416448	89422039	5592	0.0520	0.0000	0.0090	0.0000	
CNP12021	12	91161059	91171445	10387	0.0075	0.0000	0.0000	0.0181	
CNP12022	12	92721811	92725697	3887	0.0118	0.0000	0.0271	0.0542	CRADD
CNP1879	12	98319424	98322865	3442	0.1747	0.0000	0.2348	0.0023	ANKS1B
CNP12028	12	99460967	99468082	7116	0.0112	0.0000	0.0158	0.0000	NR1H4

CNP12031	12	109718337	109720108	1772	0.0077	0.0000	0.0023	0.0564	
CNP12033	12	113116586	113122288	5703	0.0075	0.0000	0.0316	0.0271	
CNP12034	12	116533707	116535910	2204	0.0076	0.0000	0.0587	0.0248	KSR2
CNP12035	12	118473270	118475144	1875	0.0075	0.0000	0.0609	0.0045	
CNP12037	12	120020329	120022886	2558	0.0076	0.0000			
CNP12038	12	122681000	122761807	80808	0.0000	0.0074	0.0000	0.0045	GTF2H3,EIF2B1, C12orf38,ATP6V0A2
CNP12039	12	125388402	125395161	6760	0.0074	0.0000	0.0045	0.0023	
CNP1893	12	125566291	125570543	4253	0.0335	0.0000	0.0497	0.0000	
CNP1894	12	126141646	126151541	9896	0.1338	0.0000	0.0181	0.0000	
CNP12043	12	126158640	126170328	11689	0.0112	0.0000	0.0068	0.0000	
CNP12046	12	127796462	127798498	2037	0.0264	0.0000	0.0813	0.0316	
CNP12049	12	128624510	128626094	1585	0.0195	0.0000	0.0181	0.0000	TMEM132D
CNP1898	12	129714262	129716322	2061	0.0372	0.0000	0.0068	0.0000	
CNP12051	12	130254437	130289269	34833	0.0000	0.0112	0.0000	0.0113	LOC116437
CNP1901	12	130360121	130362400	2280	0.0000	0.3506			
CNP1902	12	130382166	130391707	9542	0.0335	0.0000	0.0113	0.0000	
CNP12054	12	130466075	130524698	58624	0.0112	0.0037	0.0068	0.0045	
CNP12055	12	130680837	130686668	5832	0.0037	0.0524	0.0090	0.0135	
CNP1906	12	130698537	130699288	752	0.3694	0.0000	0.4695	0.0000	
CNP12057	12	132228514	132288262	59749	0.0000	0.0149	0.0090	0.0113	ZNF10, ZNF268
CNP12058	13	18041824	18165293	123470	0.0000	0.0111	0.0000	0.0045	LOC729524, LOC283523
CNP1912	13	19363397	19367459	4063	0.0407	0.0000	0.0113	0.0000	
CNP12061	13	21994827	22004855	10029	0.0000	0.0224	0.0000	0.0226	
CNP12062	13	22443593	22451522	7930	0.0111	0.0000	0.0068	0.0000	
CNP1920	13	24407846	24413343	5498	0.2616	0.0000			CENPJ
CNP1921	13	25108823	25124911	16089	0.1311	0.0000	0.0700	0.0000	ATP8A2
CNP1922	13	31430622	31436423	5802	0.3222	0.0000	0.1332	0.0000	LOC196549
CNP1924	13	36970036	36982757	12722	0.3148	0.0000	0.5350	0.0000	
CNP1926	13	38645763	38649136	3374	0.1541	0.0000			
CNP12076	13	42103086	42123720	20635	0.0111	0.0000	0.0135	0.0000	
CNP1928	13	42497548	42501093	3546	0.0000	0.1487	0.0000	0.0226	DNAJC15
CNP12077	13	51756793	51788011	31219	0.0199	0.0159	0.0090	0.0542	
CNP1938	13	51995985	52003786	7802	0.2813	0.0000			LOC220115
CNP1941	13	56656271	56676381	20111	0.4407	0.0000	0.2415	0.0023	
CNP12082	13	56708301	56721044	12744	0.0148	0.0148	0.0090	0.0135	
CNP1942	13	56767188	56786596	19409	0.0333	0.0000	0.0181	0.0000	
CNP12084	13	56842712	56848581	5870	0.0074	0.0000	0.0068	0.0000	
CNP12085	13	57488282	57495029	6748	0.0456	0.0000	0.1061	0.0000	
CNP12086	13	60611470	60616344	4875	0.0114	0.0000	0.0135	0.0000	
CNP12088	13	62216545	62527158	310614	0.0074	0.0000	0.0045	0.0000	
CNP1946	13	63122789	63134693	11905	0.0556	0.0000	0.0700	0.0000	

CNP12091	13	63227094	63303323	76230	0.0037	0.0074	0.0181	0.0135	OR7E104P
CNP12093	13	64198454	64209619	11166	0.0000	0.0075	0.0023	0.0113	
CNP12094	13	65094528	65103708	9181	0.0074	0.0000	0.0000	0.0023	
CNP12099	13	66945140	66954900	9761	0.0152	0.0000	0.0068	0.0000	
CNP1952	13	68149981	68166243	16263	0.0556	0.0000	0.0993	0.0000	
CNP12104	13	69640329	69670896	30568	0.0111	0.0000	0.0226	0.0000	
CNP12106	13	70314510	70328585	14076	0.0074	0.0000	0.0000	0.0000	
CNP1956	13	71375556	71378557	3002	0.3849	0.0000			
CNP1960	13	75007535	75015769	8235	0.0000	0.0965	0.0000	0.0316	COMMD6
CNP12108	13	75509750	75510848	1099	0.0153	0.0000	0.0181	0.0000	
CNP12110	13	78101102	78105643	4542	0.0195	0.0000	0.0045	0.0000	C13orf7
CNP12113	13	82821536	82825906	4371	0.0156	0.0000	0.0068	0.0000	
CNP12116	13	84446480	84453972	7493	0.0074	0.0000	0.0113	0.0000	
CNP12118	13	88594853	88637414	42562	0.0074	0.0037	0.0045	0.0023	
CNP1972	13	103074861	103076411	1551	0.0444	0.0000	0.0045	0.0000	
CNP12127	13	109471611	109473200	1590	0.0349	0.0000			
CNP1979	14	18521076	18539520	18445	0.2154	0.2073			
CNP1983	14	19270023	19493212	223190	0.0000	0.5688	0.7991	0.0384	OR4K5, OR4K2, OR4Q3, OR11K2P, OR4N2, OR4M1, OR4K1
CNP12138	14	19591275	19609202	17928	0.0000	0.0297	0.0203	0.0000	OR4L1
CNP12139	14	20034116	20041622	7507	0.0000	0.0075	0.0000	0.0068	
CNP1984	14	20419446	20479821	60376	0.0336	0.0187	0.0361	0.0045	RNASE3, LOC643332
CNP1985	14	21119983	21125597	5615	0.0000	0.0558	0.0023	0.0090	
CNP12144	14	22164681	22169049	4369	0.0976	0.0000			DAD1
CNP12152	14	25832761	25849239	16479	0.0074	0.0000	0.0000	0.0000	
CNP12153	14	27738124	27740489	2366	0.0400	0.0000	0.0135	0.0339	
CNP12155	14	35741780	35744784	3005	0.0265	0.0000	0.0023	0.0835	
CNP12157	14	39940733	39942282	1550	0.0117	0.0000			
CNP12158	14	40541848	40555277	13430	0.0075	0.0000	0.0045	0.0158	
CNP2007	14	40680246	40727099	46854	0.2119	0.0000	0.3499	0.0000	
CNP12161	14	40885215	40927856	42642	0.0074	0.0000	0.0090	0.0023	
CNP12162	14	41936937	42030401	93465	0.0074	0.0000	0.0023	0.0135	
CNP12163	14	42665709	42669587	3879	0.0074	0.0000	0.0023	0.0339	
CNP2014	14	43571678	43600205	28528	0.0409	0.0000	0.0023	0.0000	
CNP12166	14	43688705	43691381	2677	0.0114	0.0000			
CNP12167	14	44895806	45085468	189663	0.0112	0.0000	0.0068	0.0000	
CNP12175	14	60901611	60909127	7517	0.0192	0.0000	0.0113	0.0045	PRKCH
CNP12177	14	61725259	61734091	8833	0.0114	0.0000	0.0090	0.0226	
CNP12178	14	64085406	64089282	3877	0.0000	0.0114	0.0000	0.0158	C14orf50
CNP12180	14	64804950	64812189	7240	0.0000	0.0223	0.0000	0.0113	
CNP2023	14	69088121	69092220	4100	0.1561	0.0000	0.3205	0.0000	

CNP12186	14	71877157	71879889	2733	0.0074	0.0000	0.0045	0.0519	RGS6
CNP2026	14	73070876	73090732	19857	0.7208	0.0000	0.6524	0.0000	HEATR4, ACOT1
CNP12187	14	73101243	73120017	18775	0.0075	0.0037	0.0384	0.0068	ACOT2, NT5CP1
CNP12192	14	77856088	77861755	5668	0.0074	0.0000	0.0135	0.0068	
CNP12193	14	78230938	78235360	4423	0.0112	0.0000	0.0339	0.0000	NRXN3
CNP12194	14	81705838	81708578	2741	0.0170	0.0000			
CNP12198	14	85356069	85381922	25854	0.0112	0.0000	0.0361	0.0000	
CNP12199	14	85530379	85558194	27816	0.0112	0.0000	0.0361	0.0090	LOC283584
CNP12200	14	87468124	87492318	24195	0.0074	0.0000	0.0023	0.0000	GALC
CNP12202	14	88923778	88925959	2182	0.0114	0.0000	0.0090	0.0226	C14orf143,CHES1
CNP12205	14	92909950	92924155	14206	0.0077	0.0000	0.0000	0.0000	KIAA1409
CNP12257	15	18415652	18454752	39101	0.0222	0.0000	0.0000	0.0000	V-set
CNP2057	15	19803370	20089386	286017	0.0000	0.7778	0.5779	0.1242	V-set, LOC646396, LOC388076, IGHV1OR15-1, OR4N3P, OR4Q1P,OR4M2,OR4N4, OR11K1P
CNP12277	15	20232440	20646852	414413	0.0074	0.0037	0.0158	0.0090	LOC283767, TUBGCP5, LOC729892, NIPA2, LOC729894, CYFIP1
CNP12278	15	20659585	20675140	15556	0.0793	0.0000	0.0135	0.0000	NIPA1
CNP2060	15	21606534	21610186	3653	0.0407	0.0000	0.0339	0.0000	
CNP12281	15	21809024	21826358	17335	0.0112	0.0000	0.0023	0.0000	
CNP12282	15	21937718	21985625	47908	0.0148	0.0000	0.0181	0.0000	
CNP2061	15	22029857	22065565	35709	0.4275	0.0000	0.3476	0.0000	
CNP12287	15	22161116	22202157	41042	0.0407	0.0185	0.0203	0.0497	
CNP2062	15	22226226	22269689	43464	0.3481	0.0111	0.2370	0.0248	
CNP2063	15	22276386	22297003	20618	0.0299	0.0075	0.0226	0.0135	
CNP12292	15	22329509	22343467	13959	0.0112	0.0000	0.0000	0.0000	
CNP12293	15	22620644	22635939	15296	0.0111	0.0000	0.0158	0.0000	
CNP12294	15	22972700	22981332	8633	0.0186	0.0000	0.0700	0.0000	
CNP2067	15	25591185	25601401	10217	0.1148	0.0000	0.0293	0.0000	
CNP2070	15	28235887	28289587	53701	0.0187	0.0000	0.0339	0.0000	
CNP2073	15	28377089	28536721	159633	0.0000	0.9774	0.0000	0.9639	LOC643699, LOC727880, CHRFAM7A
CNP2075	15	28738294	28768337	30044	0.0370	0.0000	0.0090	0.0203	FAM7A2
CNP12303	15	29798781	30027160	228380	0.0000	0.0111	0.0000	0.0113	
CNP12306	15	30291556	30299512	7957	0.0522	0.0522			
CNP12309	15	31693757	31696262	2506	0.0186	0.0000	0.0000	0.0000	RYR3
CNP2082	15	32487975	32617680	129706	0.1926	0.0296	0.1738	0.0135	RRM_1, LOC145989, LOC728770, GOLGA8B, LOC644390, GOLGA8A
CNP2084	15	37375518	37379480	3963	0.1119	0.0000	0.0497	0.0000	
CNP12316	15	40191008	40194976	3969	0.0149	0.0000	0.0203	0.0000	
CNP12317	15	40208707	40221098	12392	0.0148	0.0000	0.0158	0.0000	
CNP12319	15	41680133	41682098	1966	0.0150	0.0412			STRC
CNP12325	15	42919079	42933059	13981	0.0185	0.0111	0.0023	0.0113	LOC653381

CNP12327	15	43012549	43021739	9191	0.0264	0.0113	0.0745	0.0158	
CNP2092	15	43524388	43536044	11657	0.2129	0.0000			C15orf48,C15orf21
CNP2093	15	45995539	46001995	6457	0.0556	0.0000	0.0090	0.0023	
CNP12331	15	47439816	47471374	31559	0.0075	0.0000	0.0045	0.0000	GALK2, C15orf33, LOC728954
CNP12332	15	50053027	50060576	7550	0.0120	0.0000	0.0135	0.0000	MAPK6
CNP2099	15	54577995	54588269	10275	0.1185	0.0000	0.1219	0.0000	Transposase
CNP12340	15	60248389	60254287	5899	0.0150	0.0000	0.0000	0.0000	
CNP2112	15	74127925	74131944	4020	0.0672	0.0000			NRG4
CNP2113	15	74678296	74682830	4535	0.4556	0.0000	0.6907	0.0000	ZNF291
CNP12346	15	77335797	77340887	5091	0.0111	0.0000	0.0158	0.0000	LOC729911
CNP12347	15	78310026	78313661	3636	0.0153	0.0000	0.0203	0.0000	
CNP2118	15	82331742	82334554	2813	0.4000	0.0000	0.2415	0.0000	ADAMTSL3
CNP12349	15	84142284	84151045	8762	0.0148	0.0000	0.0135	0.0000	
CNP12350	15	84312709	84322841	10133	0.0074	0.0000	0.0226	0.0000	
CNP12352	15	85707205	85711226	4022	0.0186	0.0000	0.0023	0.0000	
CNP12355	15	88306853	88311123	4271	0.0188	0.0000	0.0023	0.0000	
CNP12356	15	88433614	88579397	145784	0.0000	0.0148	0.0000	0.0045	LOC390637, CIB1
CNP12359	15	91605927	91621304	15378	0.0037	0.0074	0.0000	0.0068	
CNP12360	15	91656315	91667141	10827	0.0074	0.0000	0.0045	0.0000	
CNP12363	15	95618796	95633187	14392	0.0536	0.0000	0.1016	0.0000	
CNP12368	16	1260595	1289926	29332	0.0074	0.0037	0.0181	0.0023	
CNP12369	16	2646796	2669702	22907	0.0000	0.0260	0.0000	0.0339	PDPK2, zf-CCHC, LOC283874
CNP2139	16	12607660	12614014	6355	0.0370	0.0000	0.0045	0.0000	
CNP2141	16	14897364	15016088	118725	0.0000	0.8409	0.0000	0.9594	LRRCT,LOC728138, PDXDC1, PKD1P3,NPIP,NOMO1,
CNP12388	16	15888009	15931537	43529	0.0000	0.0222	0.0000	0.0451	C16orf63
CNP12389	16	15979352	15985377	6026	0.0148	0.0000	0.0000	0.0000	ABCC1
CNP2145	16	16540862	16598301	57440	0.0340	0.0642	0.0068	0.0519	,
CNP2147	16	18501901	18585612	83712	0.0308	0.0962			LOC653190
CNP2150	16	19853151	19874863	21713	0.1222	0.0000	0.2573	0.0023	
CNP2153	16	20420282	20440540	20259	0.0556	0.0000	0.0113	0.0000	
CNP12405	16	20453641	20464610	10970	0.0075	0.0075	0.0135	0.0181	ACSM2
CNP2156	16	21422575	21498841	76267	0.0000	0.9545	0.0000	0.7472	IMAA,LOC646828
CNP2157	16	22465433	22612022	146590	0.0000	0.9551	0.0000	0.9819	LOC653786
CNP2163	16	29040382	29041501	1120	0.0861	0.0000	0.0090	0.0203	RUNDC2B
CNP2167	16	32054387	32542265	487879	0.5131	0.0899			HERC2P4, LOC390705, LOC730210, LOC730219, LOC730207, LOC729264, LOC647157
CNP12431	16	32806748	32823606	16859	0.0681	0.0766	0.0519	0.0451	FLJ46121
CNP2172	16	33208395	33618281	409887	0.0115	0.8391	0.0045	0.7630	V-set,LOC653557, LOC652525
CNP2174	16	34324072	34614568	290497	0.0000	0.0667	0.0000	0.1603	LOC146481
CNP12439	16	34879419	34916829	37411	0.0000	0.0074	0.0000	0.0045	LOC729564
CNP12441	16	52967738	52977129	9392	0.0148	0.0000	0.0181	0.0000	

CNP2184	16	54353890	54379945	26056	0.2889	0.0000	0.2664	0.0000	CES4
CNP2185	16	54399883	54420211	20329	0.0000	0.2884			CES1
CNP12448	16	58640103	58654487	14385	0.0189	0.0000	0.0090	0.0000	
CNP12450	16	62636133	62671716	35584	0.0112	0.0000	0.0068	0.0000	
CNP12451	16	66492225	66495131	2907	0.0228	0.0000	0.0023	0.0000	PSKH1
CNP2193	16	68709061	68755857	46797	0.0000	0.7130			PDPR
CNP2197	16	72953795	73009537	55743	0.0000	0.6825			LOC440386, GCV_T, NPIP, LOC497190, LOC440348
CNP2200	16	74115584	74133500	17917	0.0000	0.0556	0.0000	0.0429	ADAT1,CHST5
CNP2202	16	75224186	75226991	2806	0.0415	0.0000	0.0271	0.0000	CNTNAP4
CNP12463	16	75758984	75780371	21388	0.0000	0.0186	0.0000	0.0023	
CNP2203	16	76929941	76942266	12326	0.3680	0.0000	0.6727	0.0023	WWOX
CNP12469	16	77319838	77327934	8097	0.0149	0.0000	0.0181	0.0000	
CNP2204	16	77617649	77620658	3010	0.0407	0.0000	0.0135	0.0000	
CNP12473	16	79460358	79471170	10813	0.0111	0.0000	0.0068	0.0000	
CNP12476	16	80395345	80398185	2841	0.0000	0.0227	0.0000	0.0226	PLCG2
CNP12477	16	82447180	82449266	2087	0.1004	0.0000	0.1106	0.0023	
CNP2215	16	86671164	86672892	1729	0.4812	0.0000	0.3837	0.0000	
CNP12486	17	5901573	5903107	1535	0.0112	0.0000	0.0135	0.0000	WSCD1
CNP12487	17	6047214	6073498	26285	0.0148	0.0000	0.0135	0.0000	
CNP2238	17	14984651	14995227	10577	0.1148	0.0000	0.0158	0.0000	
CNP2240	17	15483886	15487515	3630	0.1976	0.0000			TRIM16,CDRT1
CNP12493	17	15591355	15614730	23376	0.0000	0.0414	0.0000	0.0045	LOC644694
CNP12494	17	15617726	15635510	17785	0.0186	0.0000	0.0045	0.0023	IL6STP, MEIS3P1
CNP2241	17	16598056	16665025	66970	0.0000	0.9251			LOC266619, LOC353194
CNP2244	17	18296117	18405946	109830	0.2764	0.2236			LOC220594, FAM106A, LOC201288, LOC339244, LOC252968, FLJ36492, LOC654346
CNP12497	17	18539508	18543256	3749	0.0270	0.0000	0.0090	0.0000	TRIM16L
CNP12498	17	18636432	18642948	6517	0.0000	0.0150	0.0000	0.0293	FAM18B
CNP2246	17	19440328	19479039	38712	0.0296	0.0000	0.0542	0.0000	
CNP12504	17	22768399	22781620	13222	0.0456	0.0000	0.0135	0.0000	LOC729550
CNP12505	17	25204962	25206809	1848	0.0154	0.0000			SSH2
CNP12506	17	26040482	26043732	3251	0.0344	0.0000	0.0023	0.0000	
CNP2252	17	31461241	31509204	47964	0.0000	0.4528	0.8894	0.0181	
CNP12508	17	36457235	36463665	6431	0.0112	0.0000			
CNP12509	17	36510770	36528661	17892	0.0275	0.0000	0.0316	0.0000	
CNP2257	17	36641086	36647291	6206	0.1704	0.0000	0.0745	0.0000	KRTAP9-3
CNP2258	17	36676540	36684057	7518	0.8333	0.0000	0.8804	0.0000	
CNP2259	17	36764438	36776021	11584	0.1074	0.0000	0.0271	0.0000	KRT33B
CNP2260	17	36786395	36790200	3806	0.0000	0.1142			KRT31andKRT34
CNP12515	17	36920703	36936394	15692	0.0000	0.0111	0.0000	0.0045	KRT19, KRT15
CNP2266	17	40941539	41004287	62749	0.1115	0.0000			FLJ10120

CNP2267	17	41006741	41015665	8925	0.8008	0.0854			FLJ1012
CNP2269	17	41521619	41719991	198373	0.0000	0.2268	0.0000	0.5959	DUF741, LOC644253, ARL17, LOC644256,LOC644246, KIAA1267
CNP2270	17	41756832	42107479	350648	0.5282	0.1532	0.5959	0.1151	LOC644297,LRRC37A2, LRRC37A, NSF, ARL17, LOC728806
CNP12531	17	51515913	51527586	11674	0.0297	0.0000	0.0993	0.0000	
CNP12532	17	53567511	53569097	1587	0.0488	0.0000	0.1242	0.0000	
CNP12534	17	68304153	68306056	1904	0.0112	0.0000			SLC39A11
CNP12535	17	69257574	69259206	1633	0.0074	0.0000	0.0068	0.0000	C17orf54
CNP12537	17	72728774	72743351	14578	0.0000	0.0372	0.0000	0.0181	
CNP12540	17	74879746	74900069	20324	0.0000	0.0186	0.0000	0.0361	HRNBP3
CNP12545	18	38133	68539	30407	0.0240	0.0040	0.0519	0.0000	Tubulin_C, LOC260334
CNP12546	18	283522	294262	10741	0.0148	0.0000	0.0023	0.0000	
CNP12550	18	5918109	5923771	5663	0.0075	0.0000	0.0023	0.0000	
CNP12556	18	14583863	14594228	10366	0.0113	0.0000	0.0090	0.0000	
CNP12557	18	18308209	18319975	11767	0.0111	0.0000	0.0090	0.0000	
CNP12565	18	32508865	32513777	4913	0.0074	0.0037	0.0023	0.0135	FHOD3
CNP12567	18	33787635	33791132	3498	0.0074	0.0000	0.0181	0.0000	
CNP12568	18	34911440	34920221	8782	0.0233	0.0000			
CNP2326	18	36514418	36519387	4970	0.4053	0.0000	0.5056	0.0000	
CNP2328	18	38310567	38311469	903	0.0520	0.0000	0.1874	0.0000	LOC284260
CNP12574	18	39135060	39157329	22270	0.0074	0.0000	0.0113	0.0000	
CNP12575	18	40019717	40030582	10866	0.0148	0.0000	0.0181	0.0000	
CNP12576	18	40230885	40232624	1740	0.0680	0.0000	0.0903	0.0000	LOC342732
CNP2333	18	45251724	45257350	5627	0.1536	0.0000	0.0226	0.0000	
CNP12584	18	49461207	49464634	3428	0.0917	0.0000	0.0813	0.0000	
CNP12587	18	54081846	54086942	5097	0.0185	0.0000	0.0316	0.0000	NEDD4L
CNP12589	18	55803727	55815999	12273	0.0000	0.0111	0.0000	0.0023	
CNP2341	18	56068921	56073194	4274	0.1745	0.0000			
CNP12599	18	61788030	61791107	3078	0.0303	0.0000	0.0068	0.0000	
CNP12601	18	61980604	61984771	4168	0.0192	0.0000			
CNP2348	18	62058414	62062569	4156	0.0630	0.0000	0.0926	0.0000	
CNP2349	18	63110203	63118245	8043	0.2481	0.0000	0.0564	0.0000	
CNP2350	18	63455071	63466327	11257	0.0556	0.0000	0.0339	0.0000	
CNP12605	18	63949433	63959430	9998	0.0000	0.0148	0.0023	0.0045	
CNP2352	18	64897086	64904306	7221	0.1185	0.0000	0.0835	0.0023	
CNP12610	18	65358832	65368255	9424	0.0485	0.0000	0.0903	0.0000	DOK6
CNP12616	18	74763700	74765854	2155	0.0465	0.0000	0.0903	0.0000	
CNP2364	19	5461239	5464062	2824	0.5075	0.0000			
CNP12618	19	6805266	6833431	28166	0.0000	0.0149	0.0000	0.0135	VAV1
CNP12619	19	7357300	7360022	2723	0.0078	0.0000	0.0158	0.0000	ARHGEF18

CNP2368	19	8256197	8271067	14871	1.0000	0.0000	0.9774	0.0000	
CNP2372	19	9135672	9139121	3450	0.1636	0.0000	0.1535	0.0000	
CNP12621	19	12377146	12407188	30043	0.0000	0.0148	0.0068	0.0045	ZNF490
CNP12622	19	14776641	14783883	7243	0.0157	0.0000	0.0045	0.0000	OR7A5,OR7C1
CNP12624	19	15641343	15652621	11279	0.0000	0.0415	0.0000	0.0045	CYP4F12
CNP2381	19	15661348	15685067	23720	0.0000	0.0522	0.0000	0.0090	CYP4F12, DUF1725
CNP2384	19	20388046	20513077	125032	0.1778	0.0000	0.1016	0.0000	FLJ44894, Transposase_22
CNP12634	19	22216254	22218356	2103	0.0153	0.0076	0.0090	0.0339	DUF1725
CNP12635	19	22325358	22358984	33627	0.0148	0.0000	0.0023	0.0000	
CNP12637	19	24252658	24256797	4140	0.0296	0.0037	0.1151	0.0000	
CNP12640	19	34029192	34031422	2231	0.0305	0.0000	0.0068	0.0000	
CNP2402	19	39835983	39838570	2588	0.0741	0.0000			
CNP2406	19	40541333	40553688	12356	0.3185	0.0037	0.3454	0.0068	FFAR3
CNP12652	19	45066660	45073371	6712	0.0043	0.0427	0.0406	0.0316	FCGBP
CNP2415	19	46042834	46072786	29953	0.1487	0.0186	0.0519	0.0248	MIA
CNP12657	19	46143504	46205185	61682	0.0148	0.0000	0.0023	0.0023	CYP2B6, CYP2B7P1, DUF1725
CNP12658	19	46668500	46699711	31212	0.0111	0.0000	0.0045	0.0000	LOC729111
CNP12659	19	46751686	46754143	2458	0.0112	0.0000	0.0248	0.0000	CEACAM21
CNP12660	19	46879180	46883135	3956	0.0000	0.0150	0.0023	0.0135	CEACAM7
CNP2417	19	47986230	48149894	163665	0.0189	0.0528	0.0248	0.0406	
CNP2419	19	48248681	48288811	40131	0.0407	0.0259	0.0226	0.0226	
CNP2420	19	48316884	48335220	18337	0.0260	0.0149	0.0181	0.0090	
CNP2422	19	48394873	48448077	53205	0.3852	0.0000	0.1783	0.0000	
CNP12669	19	49588238	49630631	42394	0.0111	0.0000	0.0023	0.0000	ZNF229, ZNF285A
CNP12670	19	50542545	50583764	41220	0.0000	0.0111	0.0000	0.0068	KLC3,PPP1R13L, ERCC2
CNP12671	19	51650847	51653422	2576	0.0227	0.0000	0.0000	0.0000	
CNP12674	19	53881228	53897953	16726	0.0112	0.0000	0.0023	0.0000	FLJ36070, FUT2
CNP12675	19	55949062	55957853	8792	0.0037	0.0074	0.0113	0.0316	GPR32P
CNP2430	19	56834427	56840009	5583	0.5296	0.0296	0.3251	0.0226	SIGLEC5
CNP12679	19	58019782	58045481	25700	0.0222	0.0444	0.0226	0.0113	KRAB
CNP2434	19	58210563	58244245	33683	0.9776	0.0000	0.9503	0.0000	FLJ32214, ZNF702,ZNF816A
CNP2436	19	59422012	59433131	11120	0.1057	0.3170	0.0474	0.3093	LILRA6,LILRB3, RPS9
CNP12687	19	59477769	59491563	13795	0.0000	0.0112	0.0023	0.0090	LILRA3
CNP2439	19	59989695	60018421	28727	0.0885	0.0115	0.0271	0.0474	KIR2DP_, KIR3DL1,KIR3DL2
CNP12693	19	60959856	60969865	10010	0.0000	0.0366	0.0023	0.0181	RFPL4A
CNP12697	19	61405760	61414571	8812	0.0414	0.0000	0.0068	0.0000	
CNP12698	19	61551396	61556644	5249	0.0074	0.0000	0.0045	0.0000	
CNP12699	19	61896070	61903319	7250	0.0317	0.0000	0.0023	0.0000	OR5AH1P
CNP12700	19	62165323	62171290	5968	0.0150	0.0000	0.0068	0.0000	
CNP2453	20	1505219	1508562	3344	0.0963	0.0000	0.1964	0.0000	SIRPB1,SIRPD
CNP2454	20	1509580	1541893	32314	0.9630	0.0000	0.9436	0.0000	SIRPB1,SIRPD

CNP12710	20	3985528	3988740	3213	0.0154	0.0000	0.0429	0.0000	
CNP2457	20	4394568	4398987	4420	0.0444	0.0000	0.0135	0.0000	
CNP12719	20	14376080	14390471	14392	0.0190	0.0000	0.0000	0.0000	C20orf133
CNP2468	20	15259370	15265974	6605	0.0370	0.0000	0.0113	0.0000	C20orf133
CNP12724	20	16516058	16534634	18577	0.0111	0.0000	0.0135	0.0000	
CNP12727	20	24366791	24372700	5910	0.0000	0.0111	0.0000	0.0135	
CNP2477	20	28034013	28119552	85540	0.1524	0.0000	0.1625	0.0000	
CNP12734	20	38078172	38080421	2250	0.0075	0.0000	0.0203	0.0000	RVT
CNP2493	20	45213513	45222336	8824	0.0333	0.0000	0.0045	0.0000	EYA2
CNP12740	20	52081215	52092058	10844	0.0223	0.0000	0.1151	0.0000	BCAS1
CNP12742	20	58547104	58556092	8989	0.0186	0.0000	0.0564	0.0000	LOC284757
CNP12743	20	58831790	58841969	10180	0.0150	0.0000	0.0068	0.0000	
CNP12744	20	59003765	59023478	19714	0.0000	0.0148	0.0000	0.0339	
CNP2505	21	9758742	9965425	206684	0.0000	0.9958			BAGE4,TPTE
CNP2507	21	13374733	13463240	88508	0.4774	0.0000	0.1558	0.0000	C21orf99
CNP12751	21	13516106	14070004	553899	0.0112	0.0000	0.0113	0.0000	LOC642460,LOC441956, LOC441957, RVT_1, ANKRD21
CNP12754	21	15546277	15550528	4252	0.0116	0.0000	0.0068	0.0000	
CNP12758	21	20722523	20757493	34971	0.0149	0.0000	0.0000	0.0135	
CNP2511	21	20927716	20932562	4847	0.0632	0.0000	0.0271	0.0000	
CNP2512	21	22577638	22586527	8890	0.2305	0.0000	0.1354	0.0000	
CNP12762	21	23098732	23132654	33923	0.0149	0.0000	0.0158	0.0000	
CNP2513	21	23351419	23355207	3789	0.0522	0.0000	0.0113	0.0000	
CNP12764	21	24218044	24221560	3517	0.0155	0.0000	0.0316	0.0068	
CNP12766	21	26097651	26100417	2767	0.0205	0.0000	0.0203	0.0090	
CNP12769	21	30561523	30564727	3205	0.0380	0.0000	0.0068	0.0000	
CNP12770	21	31354121	31356175	2055	0.0187	0.0000	0.0023	0.0000	UBE3AP2
CNP12774	21	39656792	39658882	2091	0.0153	0.0000	0.0045	0.0000	
CNP12778	21	43652457	43655716	3260	0.0000	0.0118	0.0000	0.0497	
CNP2529	21	43794765	43797240	2476	0.8253	0.0000	0.7494	0.0023	HSF2BP
CNP12779	21	44062480	44064568	2089	0.0304	0.0000	0.0293	0.0000	
CNP12781	21	45599902	45603200	3299	0.0224	0.0000	0.0181	0.0000	
CNP12786	22	14870976	15029985	159010	0.0112	0.0000	0.0045	0.0000	
CNP12788	22	17006129	17009149	3021	0.0409	0.0000	0.0858	0.0000	PEX26andTUBA8
CNP12789	22	17190110	17386124	196015	0.0000	0.0111	0.0023	0.0226	GGT3, RVP, LOC386610, DGCR5, DGCR6, LOC727983, LOC653135, LOC653137, RnaseH, RVT_1, RhoGAP, DKFZp434K191, Gag_p10, PRODH
CNP2546	22	20055998	20175294	119297	0.0000	0.4242			HIC2, LOC220686, LOC645426, LOC440804
CNP12798	22	20716438	20721593	5156	0.0185	0.0074	0.0113	0.0181	LRR_1
CNP2559	22	22613016	22670785	57770	0.7782	0.0000	0.8713	0.0000	DDT, GSTT2, HS322B1A, MIF
CNP2560	22	22680529	22726814	46286	0.7630	0.0000	0.6975	0.0000	GSTT1, LOC391322, FLJ46109
CNP2563	22	23993985	24248712	254728	0.0370	0.0667	0.0135	0.0384	CTA-246H3, CRYBB2P1, LOC729882

CNP12825		22	35273727	35278691	4965	0.0516	0.0000	0.0361	0.0000	
CNP2575		22	37625201	37626850	1650	0.3158	0.0000	0.0926	0.0000	
CNP2576		22	37693565	37705253	11689	0.2556	0.0000	0.1693	0.0000	
CNP2580		22	41234550	41276824	42275	0.0037	0.3123	0.0068	0.1061	SERHL2, CTA-126B4, SERHL
CNP12833		22	48096063	48098447	2385	0.0075	0.0000			
CNP2593	X		3974707	3979273	4567	0.7338	0.0000			
CNP2603	X		13386706	13392612	5907	0.5489	0.0000	0.9729	0.0000	
CNP2604	X		16382145	16387877	5733	0.5448	0.0000			
CNP2619	X		35540930	35543706	2777	0.5370	0.0000			
CNP2621	X		47765101	47865818	100718	0.5261	0.0261	0.9932	0.0000	ZNF630
CNP2626	X		55719384	55724281	4898	0.7556	0.0000			
CNP2627	X		56678637	56689430	10794	0.6241	0.0000			
CNP2636	X		62374362	62422551	48190	0.5206	0.0337	0.9255	0.0497	
CNP2639	X		63642592	63651585	8994	0.5112	0.0299	0.9932	0.0023	
CNP2648	X		76053855	76057477	3623	0.5353	0.0000			
CNP2654	X		81283429	81298800	15372	0.5448	0.0000			
CNP2659	X		93309217	93316230	7014	0.5547	0.0000			
CNP2675	X		109825336	109826953	1618	0.5410	0.0000			CHRDL1
CNP2678	X		115051983	115064666	12684	0.7704	0.0000			
CNP2682	X		118919168	118941320	22153	0.5204	0.0223	0.9910	0.0045	AKAP14
CNP2694	X		139324076	139328860	4785	0.5762	0.0000			
CNP2704	X		146651390	146655904	4515	0.5428	0.0000			
CNP2706	X		148452463	148462404	9942	0.5502	0.0000	0.9977	0.0000	
CNP2707	X		148692078	148789418	97341	0.5131	0.0187	1.0000	0.0000	MAGEA8
CNP2717	Y		6604489	6629337	24849	0.6267	0.0000	0.0023	0.0000	
CNP2729	Y		22771258	22874762	103505	0.9889	0.0000	0.9797	0.0000	RBMY2FP, TTTY5
CNP2730	Y		22919906	22926380	6475	1.0000	0.0000	1.0000	0.0000	
CNP2733	Y		23920276	24298294	378019	0.5390	0.0297	0.0835	0.0181	RRM_1, LOC442865, OFDYP10
CNP2735	Y		24377178	24639899	262722	0.5353	0.0260			Transposase_22, TTTY3B, CDY1B
CNP2736	Y		24720477	25412124	691648	0.5390	0.0409			DAZ3, BPY2B, DAZ4, TTTY17B, TTTY4B
CNP2738	Y		25450517	26584649	1134133	0.5393	0.0375			TTTY3, DAZ4, Transposase_22, LOC286568, CSPG4LYP1,LOC442866, TTTY4C, BPY2C, TTTY17C, GOLGA2LY2, CDY1
CNP2739	Y		26687080	26847931	160852	0.5370	0.0296			PPP1R12BP